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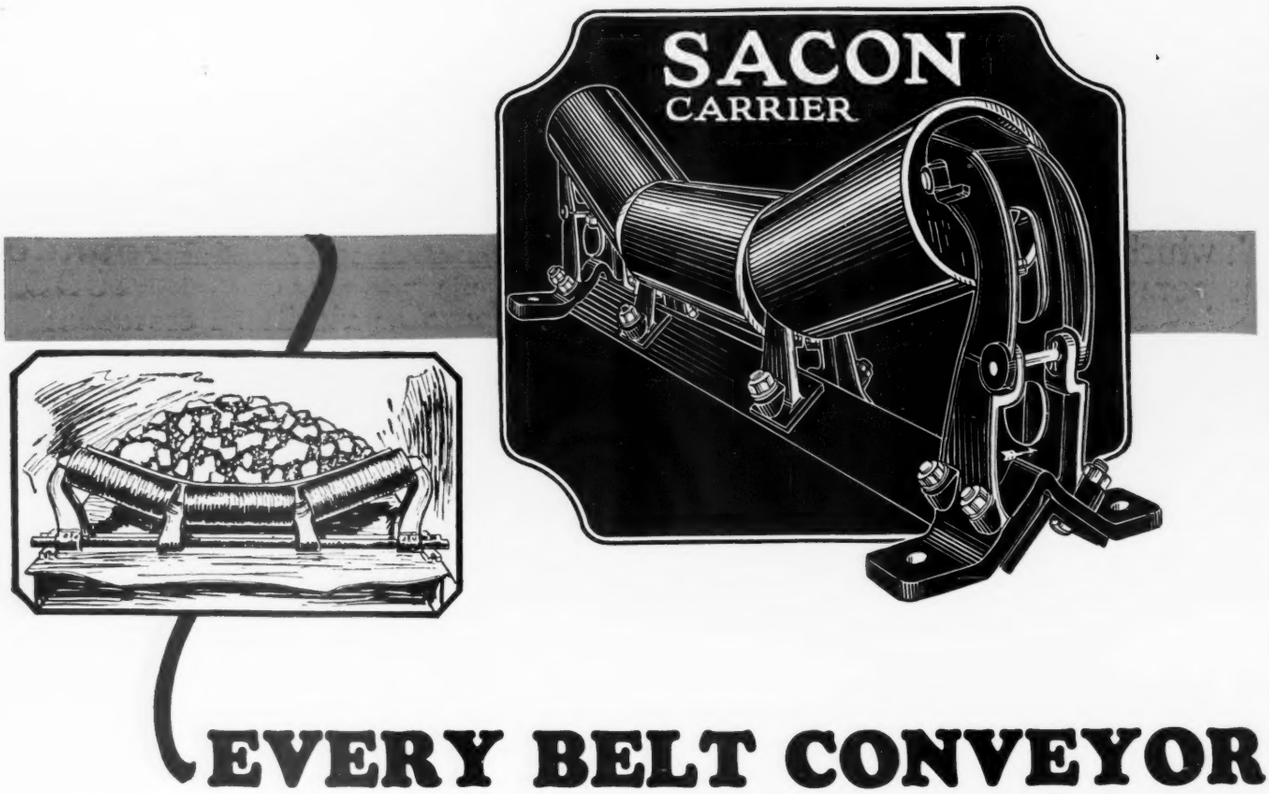

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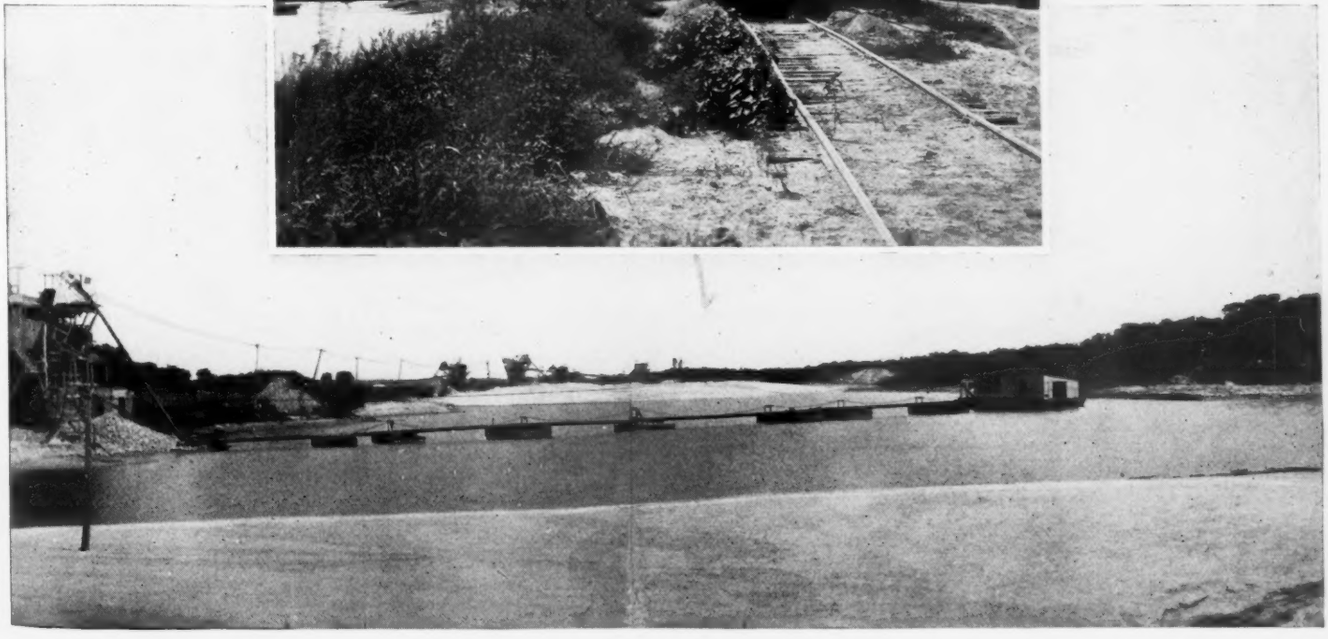
The Sand-Gravel Industry of Omaha

Lyman-Richey Sand and Gravel Company by Long Research Produces a New Form of Concrete Aggregate

THE Lyman-Richey Sand and Gravel Co. of Omaha, Neb., is among the very largest sand and gravel producers. An average daily output may be something between 250 and 300 cars. At times the production has risen to 400 cars—20,000 tons — per day. Three-fourths of its production is of a material unknown, except by reputation, outside of the district into which it ships. This is Lyman - Richey sand gravel, or shortly, sand-gravel.

Sand-gravel is a carefully graded product prepared to meet a definite specification. All of it must pass 1½-in. and practically all of it passes ¾-in. Fourteen per cent must remain on 4-mesh, 55% on 10-mesh, and 75% on 20-mesh. There must be no silt or dirt but there should be 1% of fine sand, passing 100-mesh.

This specification has been found to make a workable concrete with a lower water-cement ratio than any other grading, and since the strength of concrete is dependent on the water-cement ratio this means that such a grading will give the strongest concrete that can be made of this material with a given amount of cement. In mixes richer than 1 to 5 or 1 to 6, it also makes a workable concrete with a lower water-cement ratia than the ordinary run of aggregates. Figures which substantiate this will be



One of the 25 plants of the Lyman-Richey Co., of which five show in the lower picture. Insert shows one of the semi-portable washing equipments

given later. It seems more important to state first that luck and chance had nothing to do with the discovery of such a product. It was found by patient laboratory research, in which every variable was systematically tested and the result of such tests recorded and plotted to show the effect of each variable. Combinations made as the result of such testing gave the products its final form.

Naturally, where the grading has to be kept within narrow limits, nothing can be left to chance. The company operates 25 plants and the foreman at each plant has to see that every car is sampled and that a screen analysis of this sample is made and recorded. An inspector goes from plant to plant constantly, always changing his route so that no one knows when he is coming. He checks the sampling and screen testing, and with such close watching it is almost impossible for a car to go out unless it is up to specifications.

The highway department of Nebraska and other bodies that build highways in Kansas, Missouri and Iowa, accept the material and the Bureau of Public Roads accepts it for federal aid work in the district in which it is used.

The research was undertaken because of the shortage of good concrete aggregate in the vicinity of Omaha. There is sand in abundance—too much of it in fact—in the lands bordering the Missouri and the Platte rivers. Gravel of the ordinary sorts does not exist except in a few pockety deposits. But with the sand, and especially at depth, is the fine gravel, with pebbles between ¼-in. and ¾-in. in diameter, that is the basis of sand-gravel. These pebbles are said to be from the erosion of the Rocky Mountains and not of glacial drift as are the greater part of the gravels excavated and washed in the United States.

There are limestone ledges worked for crushed stone near Omaha but they lie under so much overburden that their working is expensive. Mining the ledge is the method used at present (see Rock Products Dec. 13, 1924, for an account of the National Stone Co.'s operations at Louisville) but mined stone cannot be cheap nor can the output be large. Dakota quartzite is imported but this is expensive on account of the high freight rate. Hence there was a real need for an aggregate of local materials that would make good concrete, especially after concrete highways began to be built, and the research which has been mentioned was undertaken to find if a really satisfactory aggregate could not be made from the materials at hand.

H. F. Curtis, president, Lyman-Richey Sand and Gravel Co.

In the course of these tests several tons of material were screened by hand and recombined in different proportions. To show how carefully every factor affecting the grading was studied, it may be mentioned that among the tests was a series dealing with the effect of minus-100 sand which was tested in regularly increasing quantities from zero to 5%. It was found that up to 4% the inclusion of such fine sand lowered the water-cement ratio and hence gave a stronger concrete, but was later found that the inclusion of much minus-100 sand promoted crozing or hair-cracking of the finished surface. By keeping the minus-100 below 2% hair-cracking was avoided and in the final specifications the minus-100 is kept at 1%.

It would be tedious to dwell on the various details of the tests that were made but there is one feature of them which will interest aggregate producers and concrete engineers everywhere. That is the relation between the modulus of fineness of this aggregate and its strength.

Prof. Abrams formula (in the simplified form) for finding the water required, the fineness modulus of the aggregate, and other factors being given is:

$$x = R\left[\frac{3}{2}p + \left(0.22\frac{m}{42} + a - c\right)n\right]$$

The reader is referred to "Bulletin No. 1" of the Lewis Institute for explanation of the terms. This formula was tried out with the sand-gravel mixture and resulted in a concrete so wet as to be "sloppy." A great many tests were made to determine the difference between the water required for a certain consistency by the formula and the water required as determined by experiment. The following table from the laboratory

The dragline goes ahead, stripping the ground for the dredge

records shows this difference, and a third column has been added showing the formula water as a percentage of the water required by experiment:

Mix by dry volume cement to aggregate	Water ratio required to give a relative consistency of 1.00 (½-in. to 1-in. slump)		
	(a) by formula	(b) by experiment	% of b in a
1 to 3	0.80	0.67	119.5
1 to 4	0.94	0.84	111.9
1 to 5	0.09	1.03	105.8
1 to 6	1.24	1.23	100.8
1 to 7	1.38	1.28	107.7

It will be noted that the formula gives too much water by about 20% for the rich mix, 1 to 3, but that it gives the correct amount with a 1 to 6 mix, the 1 to 4 and 1 to 5 mixes varying proportionately.

It may be added that the relation between the concrete strength and the water-cement ratio shown in Prof. Abrams' formula $s = \frac{15000}{7x}$ in which x, an exponent, equals the ratio of the volume of cement to the volume of mixing water, was found to hold true in every case where a workable concrete was produced.

It might at first be thought that the grading produced is that which gives the lowest percentage of voids but this is not true. It is possible to make a grading with 23% of voids but such a grading gives a lower strength. The percentage of voids giving the greatest strength is just a little more than 26%. While this *aggregate* has not the least voids the *concrete* produced by it has the least voids, thus checking the work of Profs. Talbot and Richey.

The research work which has been described was undertaken and brought to a successful conclusion by Roy M. Green, manager of the Western Laboratories, Inc., of Lincoln, Neb. Mr. Green formerly taught engineering in the University of

H. E. Schellberg, vice-president and manager

Texas, and has had years of experience in the testing of cement and aggregates. Confirmatory and parellel research work has been carried out by W. H. Campen of the Omaha Testing Laboratories, the Bureau of Public Roads and various city and county highway departments. Much of this work has been collected into a "Report of Tests," mimeographed and illustrated with many blue prints of curves, which the Lyman-Richey Co. furnishes to engineers, architects and contractors. It is a much more expensive affair than is usually got out for such a purpose, but it is complete and gives the user of sand-gravel a lot of needed information.

It was necessary to educate the users of sand-gravel, especially in regard to the relations of weight and volume. "Bulking" affects the volume as it does with ordinary sand and the proper results cannot be had with the material unless the concrete is mixed by weight or a correction for bulking is allowed. But this point has been so thoroughly explained to all regular users of sand-gravel that they understand it and make the correction for bulking as a matter of course.

The method of making the product is as unique as the product itself. It consists in varying the efficiency of a screen so as to vary the amount of undersize retained in the oversize. Since a stream of water is used to carry the material over the screen, it would probably be technically defined as a combination of screening and classification.

Except in minor details the method employed at all the plants of the company is the same. The material is dredged by a 10-in. pump and the pump discharge is delivered from a pipe that is almost vertical against a 1½-in. wire mesh screen which has only a 30-deg. inclination from the vertical. The force of the pump discharge is dispelled by its vertical rise so that the stream falls over and on to the screen with-

Left—Pump discharge and screen for oversize. Right—Water flowing over table and striking the sliding board over the screen

out splashing. It goes into a box from which it spreads on a fanning table 18 ft. wide at the lower end. Here a screen is set up at right angles to the flow, but a sliding board covers the screen where the water strikes and receives the force of the discharge. The water flows quietly from this board to the screen, the oversize, which is sand-gravel, going to one bin, and the sand and water to a smaller bin or settling tank.

New type of semi-portable washing plant recently developed

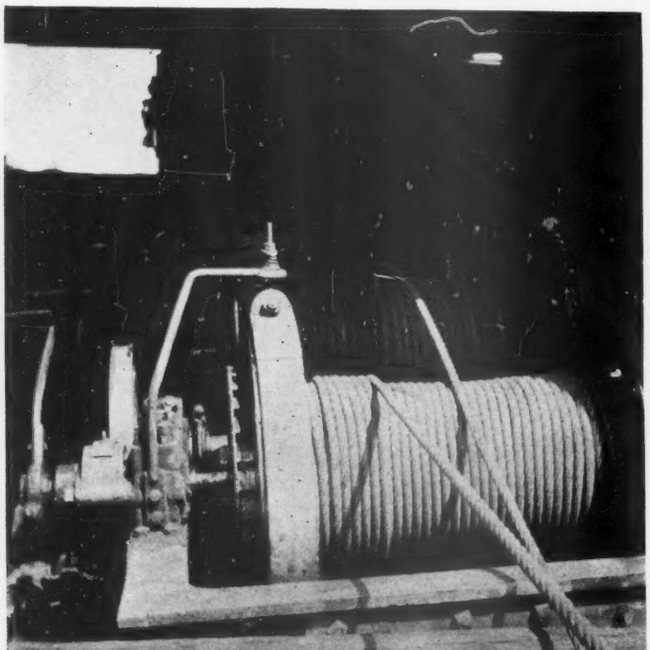
The board against which the water strikes is the regulating device by which the grading is varied. It can be set up and down so as to cover more or less of the screen. The more the screen is covered the more fines will go in the oversize. The method seems crude and inexact but in its working it is very exact. The men who are familiar with the work can keep the grading just what it should be, no matter how much the sand may vary as it comes from the pit. And, of course, the work is constantly checked by the man who samples the cars and makes screen tests, and if the grading is not correct a change is made at once. The important thing is to keep the percentage on 10-mesh as nearly as possible correct, the percentages of the other sizes following that. A tolerance of 5% from the standard of 10-mesh is allowed on this specification which gives ample latitude for the variations of practical working.

The screen used is a 5-mesh screen with rather light wire, since this gives the greatest percentage of opening. It does not last so long as a heavy wire or punched plate screen would last, but the efficiency is considered more important than the cost.

This method was suggested by Wesley Taylor, plant superintendent, but it, and all the other details of plants and dredges was worked out in the present form by the company's engineer, George Schellberg.

Plants are operated at Lewisville, Freemont, Meadow, Allis, Valley, Columbus, Central City, Grand Island, Kearney and Bridgeport, all of which are in Nebraska, although some are a considerable distance from Omaha. The farthest plant is at Bridgeport, about 400 miles from the city. From this plant sand is shipped long distances to the west, engine sand being shipped as far as Salt Lake City. These plants are situated on different railroads so that shipments without transferring from one road to another may be made over the Missouri Pacific, the Burlington, the Chicago and Northwestern, the Rock Island, the Union Pacific and the St. Joe and Grand Island railroads. Thus not only the state of Nebraska but the adjoining parts of adjacent states are brought within the shipping range.

The plants are arranged in groups, as it has been decided that the operation of several small plants is cheaper than the operation of one large plant. This might be doubted but there is no going back of the figures on the cost sheets which have been carefully kept for a number of years. The actual expense of this small plant production in labor, power and supplies will compare quite favorably with large plant production and the difference if any, is more than made



Left—Type of car puller used. Right—All the oversize from four months' steady dredging

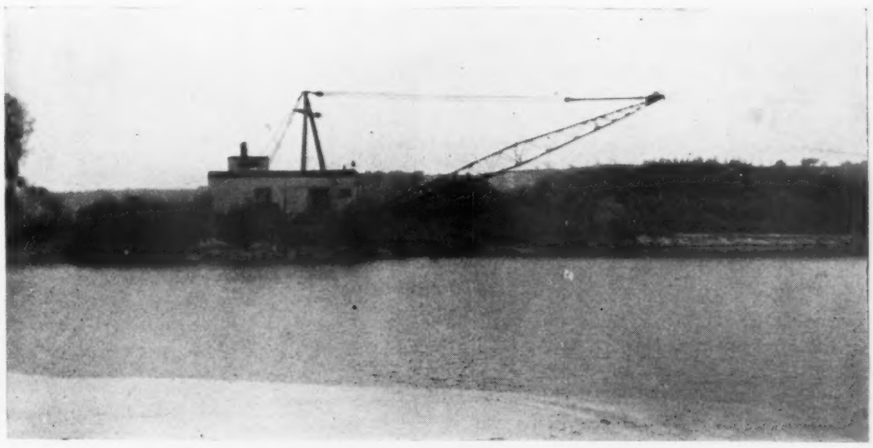
up by the much lower first cost and the lower depreciation. The Lyman-Richey company would not care to say that this would hold true everywhere, and it probably would not. But so far they have found it to hold true for the conditions under which they operate, and attempts to use other methods have not been able to produce the material wanted at so low a cost.

The ground worked at all the places above mentioned is in low lying areas in the river bottoms and the surface of the ground is only a few feet above the ground water level. Dredging is the method employed. The dredges are all fitted with 10-in. American Manganese Steel Co.'s dredging pumps, with the exception of a few which are fitted with 8-in. pumps but which are being equipped with 10-in. pumps as fast as the work will allow. There are two steam driven dredges in use but all the others are electrically driven. General Electric motors of 250 h.p. are used and in all the dredges the writer saw the drive from the motor to the pump was by a belt. The hulls are substantially built of wood and the machinery is enclosed in a cabin. Transformers are placed on the shore and the cables carried to the dredge in the ordinary way.

The washing plant and bin is as small and simple as it is possible to make it and

George D. Schellberg, engineer and purchasing agent

have it perform the work. This is because of the peculiar system of working the ground that is employed. As soon as the dredge has worked out the ground in front of a plant, so that a long pipe line would be needed the plant is moved. Sometimes two moves are made in a season. This moving has been anticipated and the ground laid out accordingly. The railroad tracks on which cars are filled and stored are carried along beside the cut and advanced as the work proceeds. The plants are skidded to the new positions except where it is easier to dismantle them and re-erect them. The men who do the work are trained to it so that the time lost in changing from one position to another is small.



Dragline stripping new ground near the Platt river

As regards the actual dredging operation the most unusual feature about it is the depth to which the ground is worked. Very long suction pipes are employed as the material is dug at a depth of 60 ft. in some of the locations. But the ordinary A-frame suspension appears sufficient to carry the long pipe without difficulty.

No cutters are employed and their necessity has not been felt because the material flows freely to the suction, maintaining a fair percentage of solids in the pump discharge. Since the grading of the material is dependent more upon screening than upon settling, variations in the discharge do not affect the grading so seriously as they would if only settling were relied upon.

Fred P. Curtis, secretary

No attempt is made to store material in either bins or stockpiles. The plant bins have a capacity of about a carload, which is all that is necessary when cars are at the plant. Owing to the flat ground, cars have

E. H. Palmquist, treasurer

to be pulled through the plants by car pullers instead of being run through by gravity. Ledgerwood and American Hoist and Derrick hoists are used for this purpose. In some cases these are regular car pulling hoists, in others they are hoists which had formerly been used on dredges and displaced for the more severe work on the dredge by newer machines. Some of these car pulling hoists are steam driven, upright portable boilers being used to make the

However, it is possible that some sort of feeder or cutter may be tried out in the near future and the use of such devices has resulted elsewhere in economy of production.

steam.

The ground to be dredged is stripped by dragline excavators which in all cases are steam driven. One of these machines is a Monaghan, the others are all "composites," rebuilt machines bought by the company and fitted with new engines and booms and whatever else might be required. Some of these have been fitted with engines built by the American Hoist and Derrick Co. which were designed for this particular use.

The amount of stripping is not large and when the depth of the deposit is considered it might be wondered why any stripping was necessary. But it must be remembered in considering the work of these plants that the product has to meet more rigid specifications than usual and that one of these specifications says that no silt or dirt shall be in the product. Stripping gets rid of *all* of the dirt. The water coming from the pump is not even tinted with clay or mud, or at least it was not in the operations which were inspected. There is another advantage in stripping in that it gets rid of the leaves and trash which has been brought on to the ground by high water from the river.

Whenever it is possible to do so without spoiling the ground for further operation,

Wesley Taylor, plant superintendent

the strippings are side-cast into the pond left by working. In other cases the strippings are piled on ground that is left behind in dredging.

There is a considerable amount of material wasted in dredging both as unwanted sand and oversize. The oversize is taken out by the 1½-in. screen against which the pump discharge is directed and consists mostly of stones with some sticks and pieces of wood. This is allowed to accumulate below the screen and is left on the ground when the plant is moved. It is not large in quantity.

Sand has to be wasted in large amount in order to produce the proper grading for sand-gravel. The sand wasted varies at different plants and in different parts of the same deposit. It is difficult to estimate what the waste may be but it is thought to be nearly two-thirds of what is pumped.

Of course, a great deal of sand is sold, outside of what is sold in sand-gravel. This sand goes for use as fine aggregate with

Roy M. Green, manager Western laboratories

crushed stone, for use in plastering, as engine sand and all the other uses which have been found for sand and which are being found almost daily. But large as the market is, it does not begin to absorb the sand left after making sand-gravel and others of the coarser products.

One of these coarser products is roofing gravel for which there is a considerable demand in Omaha and other cities. It is estimated that between 18 and 20 cars of good sand have to be wasted when a carload of roofing gravel is produced.

Cutting Ice in Winter

In the winter time the company goes into the ice business, cutting ice on the ponds left by dredging and storing it for sale in the summer. The trackage at the plants and some of the mechanical equipment can be utilized in this work. Its main advantage, however, is that it gives employment to the men during the season when sand and gravel production is impossible. All the men except those belonging to the "floating labor" class are thus employed all the year around and the company finds this a great advantage since it can always start its producing season with its organization intact.

The relations between the company and its employees are the best. It was learned while the materials for this article were being gathered that all the men on the payroll had been at least four years with the company and that a great many had been employed for long periods.

The present company was formed a number of years ago by the union of two sand companies, the Lyman Sand Co. and the Richey Sand Co., and this is the reason for the compound name. It was for a long time known as the Lyman-Richey Sand Co. but sand-gravel became such an important part of its output that the word gravel was added to the name.

H. F. Curtis, who has headed the company for a number of years, is president and one of his sons, L. C. Curtis, is vice-president and sales manager, while another, F. P. Curtis, is secretary. The manager of the company is H. E. Schellberg, who is also vice-president and his brother, George D. Schellberg, is the company's engineer and purchasing agent. E. H. Palmquist is the treasurer.

H. E. Schellberg is well known to the producers of the country and is a familiar figure at the conventions of the National Sand and Gravel Association and the Missouri Valley Association. He began as an employee of the company about the time he began his business life and has worked his way to the top.

The great success which this company has made emphasises a truth which ROCK PRODUCTS has tried to bring home to its readers in season and out of season, that of knowing one's product thoroughly as a means to success. It is not enough to study the producer's problems; the consumer's problems must receive equal consideration. If the Lyman-Richey Sand Co. had not gone outside its problems of production it might have become a very efficient producer of sand, but sand-gravel would never have been heard of and its business would have been confined to what is now its lesser market. By having the conviction that the consumers of aggregate needed something more than they were able to buy, and by seeking systematically and scientifically to supply the demand they have not only increased the business but have performed a real public service.

Magnesite Drops Into River When Seattle Dock Burns

A LARGE quantity of finished magnesite product, estimated at about 1500 tons, and dock equipment owned by the Northwest Magnesite Co. of Chewelah, Wash., was destroyed by a recent fire of undetermined origin on the Great Northern dock, Seattle, Wash. The magnesite was stored on a unit of the dock leased by the company and was to be shipped to an Eastern city via the Panama canal. The magnesite dropped into the river when parts of the burned dock gave way.

It was estimated at the company's office at Chewelah, Wash., that the loss sustained will be approximately $60,000, divided equally between the dock equipment and the magnesite product and fully covered by insurance. —*Seattle (Wash.) Chronicle.*

A Modern English Lime Works

Plant of the Callow Rock Lime Co. Which Exemplifies the Value of Technical Aid in Construction and Operation

By R. P. Brown
National Lime Association

[This is the first of a series which R. P. Brown is writing for ROCK PRODUCTS, describing foreign lime plants. It is of especial interest as the plant has become widely known because it was designed by technical men of such high reputation. Dr. Knibbs is the author of an authoritative book on lime and magnesia, and H. S. Denny is a well-known metallurgical engineer.—The Editors.]

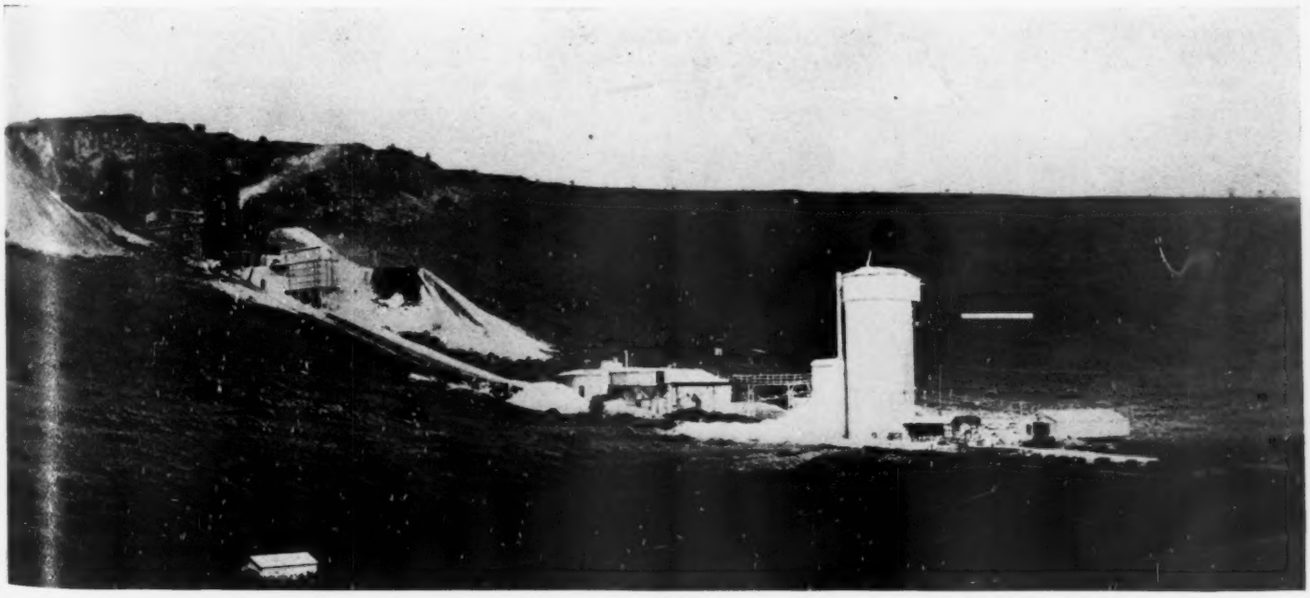
ONE of the most modern and efficient lime plants in England is that of the Callow Rock Lime Co., located near Cheddar, Somerset. This plant has not been handicapped by old kilns or equipment, but was designed and operated from the first on a modern basis. The beginning and development of this plant came about in an interesting manner. F. C. Tiarks owned a farm in the vicinity of Cheddar and on having the soil analyzed found that it needed liming. He was familiar in a general way at that time with the production of agricultural lime and so did some prospecting for limestone. An abundant supply of high calcium stone was located and the farm requirements were calculated. Fortunately for the present situation, some one made a high estimate of the annual lime needs of the soil, and as the total appeared too large for ordinary field kilns, a regular lime producing plant was decided on. H. S. Denny, who is now the managing director, was requested to take charge of the design and erection of a modern plant and called upon Dr. N. V. S. Knibbs, who is still retained in the capacity of consulting chemist, for chemical assistance. Thus from its inception this plant has been under the control of trained men who knew value of technical control of quality and the necessity of an uninterrupted flow of material through the plant.

Copyright, G. V. Buck, Washington, D. C.

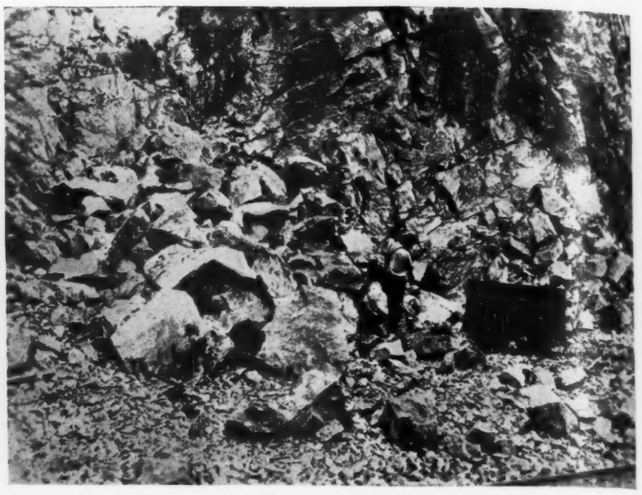
R. P. Brown, National Lime Association

The plant consists of three kilns and a hydrating unit. The quarry is at the top of a hill, which, when the writer climbed it, appeared to be almost mountainous. A heavy face has been left behind the kilns to protect them from flying stones, and a tunnel is driven through this face for the quarry cars to go directly out to the tops of the kilns.

Test holes show the presence of at least 500 ft. of strata of rock of uniform quality and the plant property comprises 300 acres of this stone deposit. The stone is dense and uniform in character and lies on a 25-deg. slope. No clay pockets or seams have been encountered and all analyses check closely. Hand work only is used in the



The quarry is behind the hill, and a bluff was left to protect the kilns from flying rocks. Cars of stone come through a tunnel to the kilns shown at the left. The silo at the right is at the hydrate plant



Left—The quarry in which only hand work is employed. Right—Close-up of the face after a blast. The larger stones are broken by hand sledging

quarry, the shots being small. Three to five holes about 9 ft. deep are shot at a time using 50% gelignite as the explosive. Remarkably few spalls result from the shots as the rock shatters easily into large lumps. Anything larger than one-man stone is either sledged to loading size or hand drilled and split with black powder.

There is practically no overburden on the stone now being quarried, 12 in. being the maximum depth of soil at any point, and generally the stone outcrops without any covering. Where there is a patch of dirt on top to be worked it is shoveled away by hand, but this is rare and as yet has never justified the use of skips or scrapers.

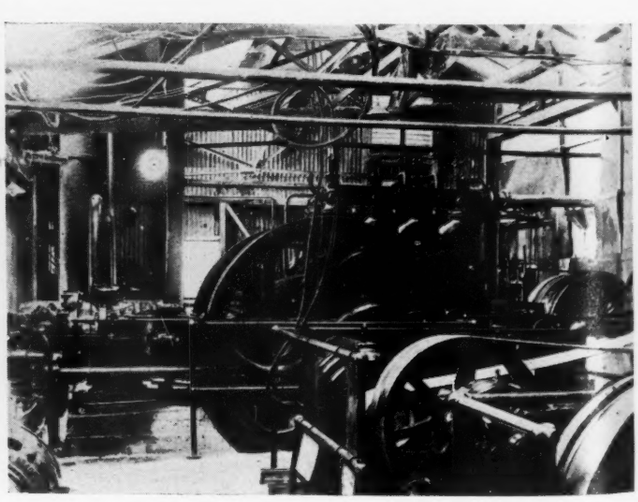
The kilns are 84 ft. high over all and 64 ft. inside the shell, the remaining 20 ft. being used for clearance at the bottom for discharge and charging hoppers at the top. The upper 15 ft. of the kiln is really an unlined storage section for the stone and the gases from the kiln are drawn off below this point. They are of circular cross section, the diameter of the unlined storage section being 11 ft. In the lined section they vary from about 8 ft. to 10 ft. in diameter, the kilns tapering outwards in the burning zone. The cooling zone is 10 ft. in diameter and its ends in a steel discharging cone with a hand operated door. Producer gas is used exclusively, two wet bottom producers supplying the gas for the three kilns.

Lime kilns. The two in front are center fired

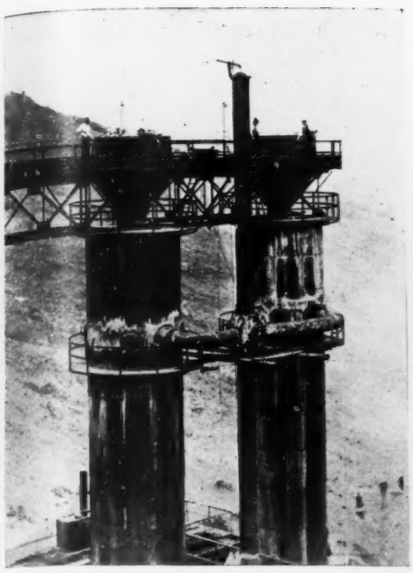
The kilns at Callow were originally fired from outside gas ports, but central burners have now been fitted. This has been accomplished by building a firebrick arch across the kiln supporting a flue which extends right across the kiln near the center. There are four ports 9x6 in. in size from which the producer gas issues. No trouble has ever been experienced due to the clogging or blocking of these ports.

The openings into the kiln which existed before changing the design to provide for center firing are now sealed by tight doors, but these doors may be opened for inspection or for using rods to bar down the lime if the kiln "sticks" or arches. It has been the experience of the operators of this plant that since the kilns have been center fired there has been a much more uniform and evenly burned product and an increase in efficiency as well. When more kilns are erected they expect to use the same system.

The kilns are operated under an induced draft equivalent to about 5 or 6 in. of water.



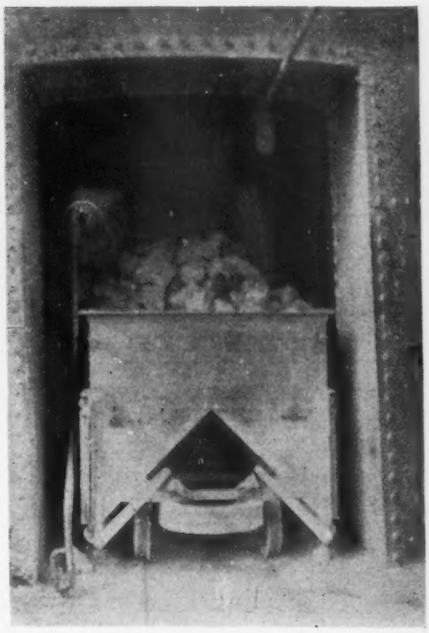
Left—Entrance to tunnel from quarry to kilns. Right—Power plant. A four-cylinder Diesel engine furnishes most of the power



No. 1 and No. 2 kilns, showing charging bells

The gas and air are regulated by valves, while the draft through the producers and kilns is regulated by two fans. One fan controls the kiln draft and the other supplies saturated air to the producers. The saturated air, or low pressure steam, which goes to the producers is obtained from a waste heat boiler operated on the exit gases from the kilns. The main supply of air for combustion enters the kiln through the draw shears and is thus preheated before it enters the burning zone. At the same time this air supply cools the lime in the cooling zone sufficiently so that it may be handled without discomfort to the bare hands. Special draft conditions are regulated by opening or closing supplementary air ports.

In order to keep a close check on performance, the temperature is recorded by electrical pyrometers which show that the producer gas reaches the kilns at a temperature of about 500 deg. C., while the exhaust gases are about 400-450 deg. C. The maximum kiln temperature is about 1400 deg. C.

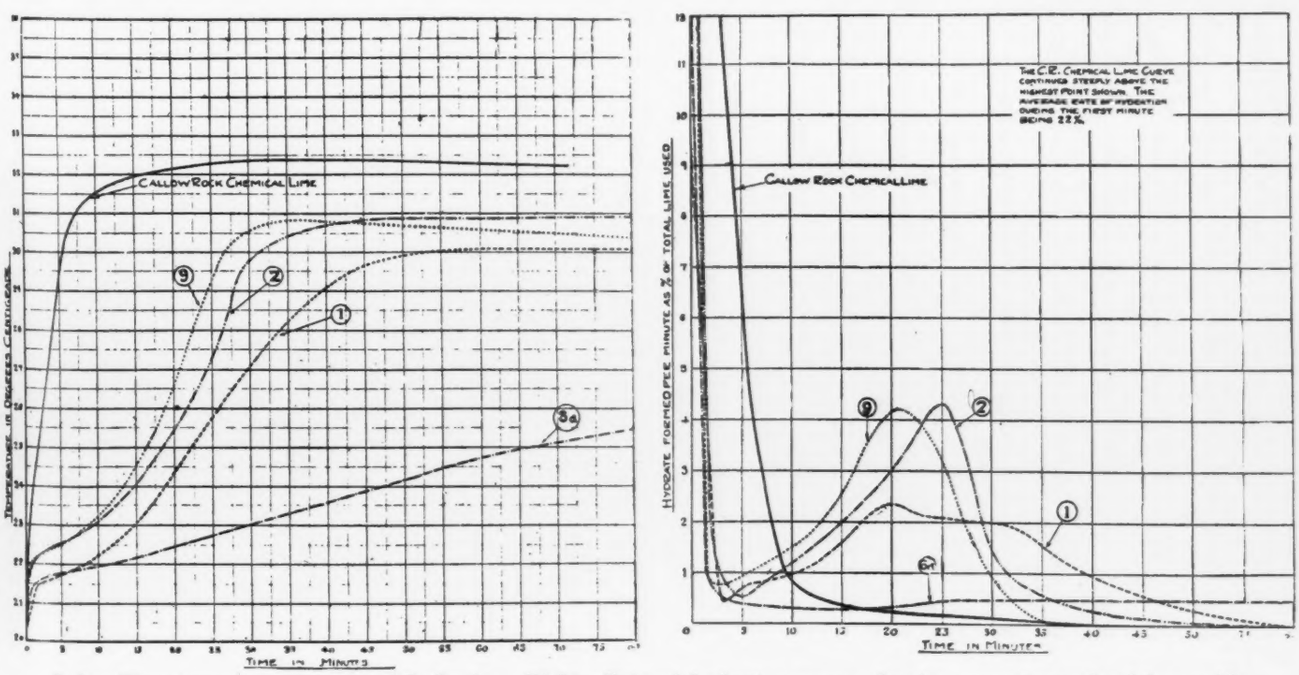


Lump lime just drawn from the kiln

Also, a continuous CO_2 recorder samples the exit gas and the record indicates from 26 to 28% CO_2 present. This exact control makes the production of uniform lime as nearly certain as is possible, and maintains the performance at a high rating. Complete records of all materials are kept, and charging all fuel against the production of lime, an average of from 4 to 4.5 tons of lime are produced for each ton of coal consumed. The coal used is low in sulphur, contains about 10% of ash and has a thermal value of about 11,500 B.t.u.

The kilns are charged steadily, 1-ton bottom-dump steel quarry cars being used. Every effort is made to keep the stone reservoir of the kiln full so as to obtain the greatest value of the exhaust gases in drying and preheating the stone before they go through the waste-heat boiler. The reservoir is sealed

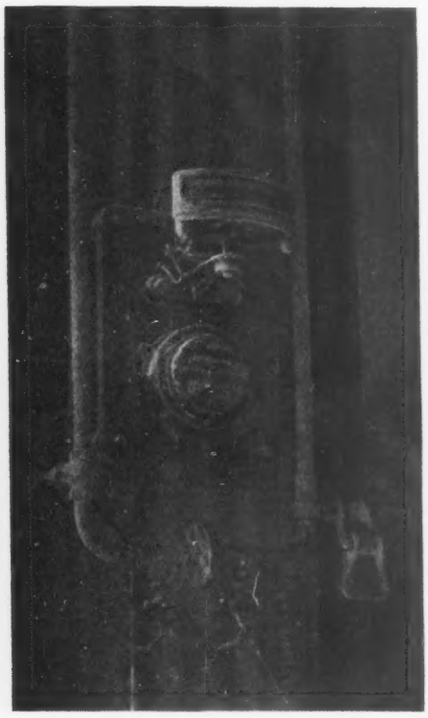
Hydrating plant with 300-ton storage tank



Left—Time-temperature curve of hydration. Right—Rate of hydration curves showing percentage of calcium oxide converted to calcium hydrate per minute

by a bell in much the same manner as a blast furnace.

Whenever the bell is opened the draft is unbalanced and there is a tendency for the fan to race. At first the fan was set solidly



Pyrometer for controling temperature of hydration

on a concrete foundation, but bearing trouble developed due to the pounding when the draft became unbalanced. This difficulty has been eliminated by bolting the fan to a mat of 12x12-in. oak timbers and no bearing trouble is now experienced.

The kilns are drawn every 45 min. during the day into steel body dump cars which go by gravity to the screen house where they are dumped on an inclined scalping screen or grizzly. The lime retained on this screen goes to the quicklime bunkers and is sold as bulk lime, and that which passes goes to a special bin which is drawn on by the hydrating department. When the demand for hydrate is heavy the bars of the screen may be set farther apart or the lump lime storage bins drawn upon. Each kiln, when being operated to capacity, will produce about 38 long tons (2240 lb.) of thoroughly burned quicklime per day.

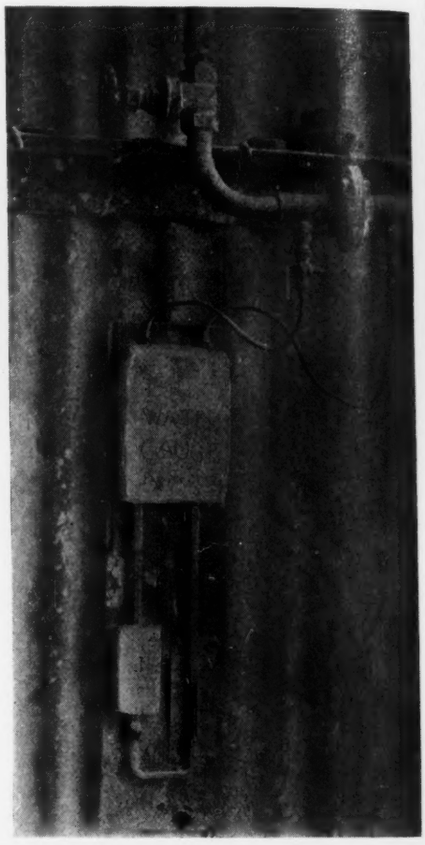
As might be expected in a plant designed as this one is, the hydrating section is composed of units specially designed to handle the type of lime produced. A continuous type hydrator, known as a Denchem unit, is employed in conjunction with an air separation system.

This hydrator consists of a long, covered trough through which a shaft with adjustable vanes revolves. The quicklime, crushed in a swing hammer mill from ¾-in. to dust, is fed from a small bunker to the hydrator by means of a screw conveyor. The water is sprayed on this steady stream of quicklime as it enters. The vanes on the shaft gradually carry the slaking lime forward, keeping the mass constantly in motion and the temperature low. A recording pyrometer is kept operating on the hydrator and the temperature is not allowed to exceed 110 deg. C. An average of 115 Imperial gallons (10 lb. per gal.) of water is used to hydrate 2240 lb. of quicklime. Particular care is used to fully hydrate the lime before it goes to storage.

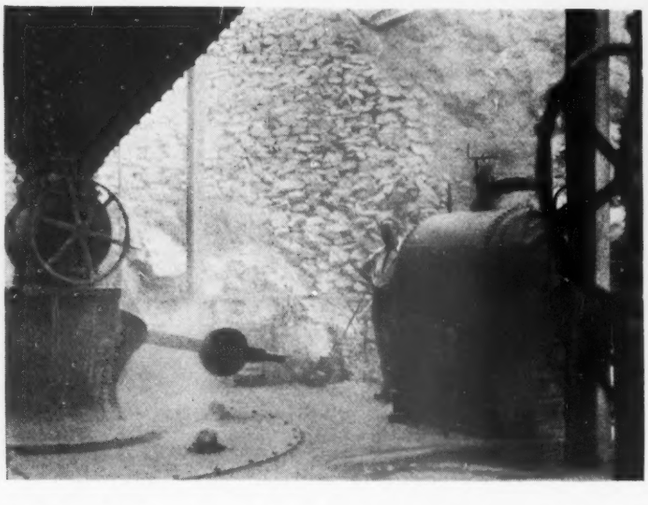
Two outlet doors are located at the far end of the hydrator, one at the bottom of the trough for a cleanout gate and the other well up on the side wall. This discharge gate is sufficiently high so that only lime which has been thoroughly hydrated, and consequently light and fluffy, can get out.

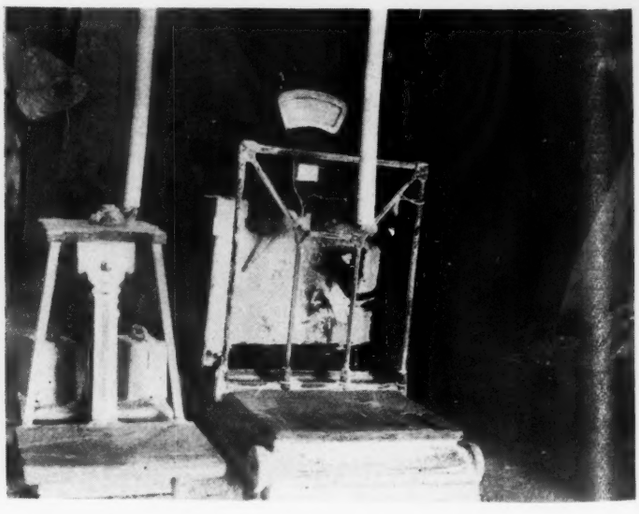
As a precaution this discharge gate is guarded by a 1-in. mesh screen. As the fresh hydrate comes from the hydrator it is picked up by a horizontal screw conveyor and carried to the boot of a bucket elevator which carries it up to the air separation system. This system operates as a closed cycle, thus minimizing the possibility of recarbonation of the fresh hydrate.

The elevator feeds the hydrate to a wind tunnel where a suction equal to about 8 in. of water is maintained. This automatically classifies the hydrate, eliminating any pieces of core or overburned material which may have gotten out of the hydrator, but that is not considered sufficient; so after having passed the suction section the hydrate is picked up again by a draft and floated on to



Water gage for measuring hydrator water





Left—Producer floor. One producer furnishes gas for three kilns. The coal hopper shown feeds through a measuring device. Right—Close-up of scales for sacking

the storage tank. Thus it will be seen that no heavy particles have any chance of remaining in the hydrate. No pulverizer is used in connection with the production of the hydrate as this company feels that material which does not hydrate readily in the special hydrator is not sufficiently active for the class of trade they supply.

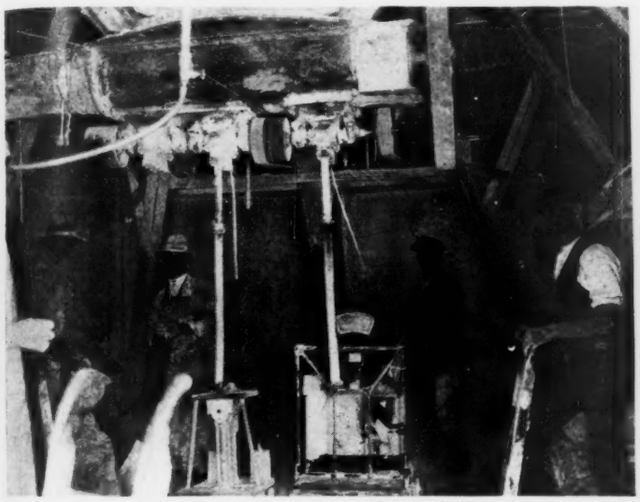
The storage tank used is a steel bin, 64 ft. high and 30 ft. in diameter, holding 300 tons, and it is said to be the largest hydrate storage bin in England. From the bin the filling sacks and there is very little waste. Storage space for 150 tons of bagged hydrate is available.

Exhaust fans are used wherever there is dust and working conditions are very satisfactory.

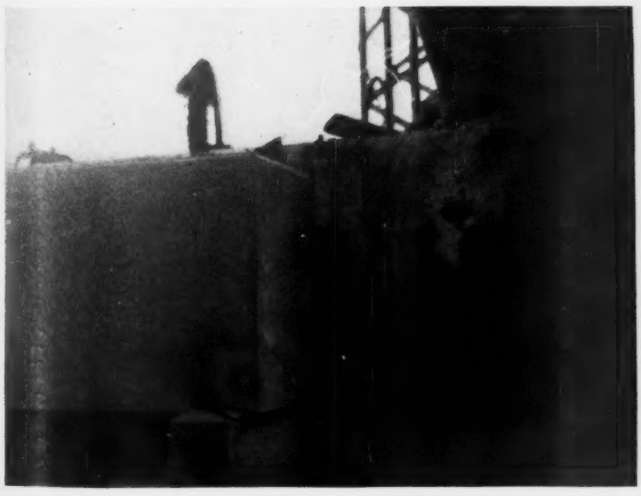
From 0.75% to 1% of excess water is present in the hydrate as shipped. This insures complete hydration, and as considerable hydrate is sold direct to sand-lime brick manufacturers, the contention that complete hydration is secured is justified. In the busy plant gives the following results

	Chemical ground lime per cent	Chemical hydrate per cent	Super-superfine hydrate per cent
CaO	97.2	75.2	74.7
MgO	0.50	0.40	0.42
Al_2O_3	0.39	0.19	0.18
Fe_2O_3	0.10	0.04	0.04
SiO_2	0.76	0.46	0.45
SO_3	0.34	0.26	0.24
CO_2	0.19	0.44	0.60
H_2O	0.59	23.00	23.20

Calculated on the non-volatile basis, the analysis shows 98% CaO in the chemical ground lime and 98.2% in the chemical and



Left—View in the sacking department. Right—A 10-ton load of lime going out on a steam lorry, a form of truck which uses about one ton of coal per week



Left—The waste heat boiler. Right—A corner in the testing laboratory

hydrate is bagged through a specially designed hand bagger. The sacks are of stout Hessian cloth lined with tarred crinkly paper and hold a hundred-weight (112 lb.) each. A standard bagging machine was tried but did not prove satisfactory under the conditions. The present practice is to hold the sack by hand on a weighing platform, insert a flexible tube in the mouth, turn on the hydrate and sut it off as the scale reading shows exact weight. The mouth of the sack is then closed by a hand operated tying device. The operators become extremely adept at season the hydrate is frequently quite warm when bagged, but no difficulty has ever been experienced from either caking or bursting of the sacks.

The plant laboratory is well equipped and constantly runs tests on the raw stone, the lump lime, and the hydrate to control the quality. Tests are run from time to time on the coal to see that it is up to standard as well. In fact, all materials purchased or sold are subject to chemical test or guarantee.

Analysis of the three chief products of the super-superfine hydrates.

Slaking tests also give considerable information of interest to special users of quicklime. Certain industries want a very "hot" lime. The combination of pure water with pure calcium oxide is attended by a heat evolution (according to Berthelot) of 15,000 calories per gram molecule, or 270 centigrade heat units (c.h.u.) per pound. Considerable research has been conducted by the Callow Rock chemists, and they have determined that their chemical ground lime liberates 264 c.h.u. per lb., and that the rate of slaking is

very rapid. This will be seen from the accompanying diagrams.

The literature issued by the company is remarkably informative and gives a complete, yet brief, review of the uses of lime in a series of simple, straightforward questions and answers; another reviews the chemical field and presents the technical phases of lime burning and hydration; still another pamphlet presents specifications for lime mortar, plaster and exterior stucco. A number of short pamphlets carrying testimonial letters, photographs of work where the lime was used, etc., are also issued. For the past year this company has maintained a booth at the Wembley Exposition. A specially trained salesman is on hand and demonstrates the properties of the material for plastering purposes and explains its uses in other fields.

The trade of the Callow Rock Lime Co. is diversified and they have kept their plant operating at capacity for a period of over 12 months. They sell primarily to the chemical industries, but have a large construction and agricultural market as well.

Practically all the lime, both lump and hydrate, is sold directly to the consumer. For hauls up to 20 miles 10-ton loads are handled economically with a steam lorry, similar to the American heavy trucks but having a steam engine as the motive power. On railroad hauls a 4-ton load is the minimum, 6 tons average and 8 tons a heavy car. Occasionally a large car capable of holding 12 tons is received, but the last type is very unusual. The hauls are comparatively short and so open top cars are used, covered by tarpaulins which are rented from the railroad company.

Every courtesy was shown to the writer by everyone connected with this organization; Mr. Tiarks and Mr. Denny at London, S. Travis, the plant manager and A. B. Edson, the plant chemist at the works. These gentlemen showed a keen understanding of not only plant problems, but also the problems of the industry, and a great interest in the industry on the American side.

Calculation of Coal Expense in Rotary Cement Kilns*

IN a series of experiments, D. A. Tchernobaieff has evolved a formula for the derivation of the heat balance in a rotary cement kiln, based on the heat of formation of cement clinker. In order to make easy application of the formula, he has prepared several tables and an example illustrating their use. The derived formula is:

$$x = \frac{1}{Q'-DW}(41647+0.2625a+1.199b)+$$

$$\frac{1}{Q'-DW}(956+0.0875a)m+$$

$$\frac{1}{Q'-DW}\cdot\frac{S}{d.B}(20.9t^\circ+5688)$$

Where x=coal expense

Q'=lower heat of combustion

D=vol. of gases at standard conditions in cu. meters per kilo of coal

S=surface of kiln in sq. meters

d=thickness of wall in meters

B=quantity of bbl. (170 kilos each) per day

t°=temp. of waste gases

a=Amt. of heat required to raise 1 kilogram molecule of H_2O from 0 deg. to t deg. C.

b=Amt. of heat required to raise 1 kilogram molecule of CO_2 from 0 deg. to t deg. C.

m=ratio of air actually admitted to the air theoretically necessary for complete combustion.

W=amt. of heat required to raise 1 cu. meter of combustion gas from 0 deg. to t deg. C. at standard conditions

*Abstract from J. of Amer. Cer. Society, 8, 702 (1925).

The first member of this formula gives us the coal expense at the dry process ($m=o$) and at the absence of convection and radiation losses.

The second member, the coal expense to evaporate the water and to warm the water vapor at the wet process.

The third member, the coal expense to compensate the losses by convection and radiation.

The expression $Q'—DW$ is the heat given by every 1 kilo of coal to the kiln as DW is the lost heat in combustion gases.

Tables to Calculate the Coal Expense

To facilitate the application of the deducted formula, Tables I, II, and III have been calculated to give the values of separate members of the formula at different temperatures of waste gases and contents of water at the wet process. For the third member the values are given at $\frac{S}{d.B}=1$ and must be calculated, in every particular case, as indicated, lower.

As a ground of calculation coal is taken with $Q = 7500$ cal. and $Q' = 7250$ cal. Coal expense is directly proportional to the expression $\frac{1}{Q'-DW}$. With an insignificant error we can in many cases take it proportional to the expression $\frac{1}{Q}$.

To show the use of the tables, the coal expense for the kilns of the heat balances of E. C. Soper, is calculated.

The Balance of E. C. Soper: The raw mixture contains 53% of water ($h = 53\%$). Coal expense = 48.06%; the heat of combustion = 5608 cal. Temperature of waste gases = 236°C.

The length of the kiln = 30.38 meters, the diameter is 2 m. The thickness of the wall is unknown; assume it to be 0.2 m. The kiln gives 166 bbl. per day. Hence $\frac{S}{d.B}=\frac{\pi\cdot 2\times 30.48}{0.2\times 166}=5.77$. The coal expense for the temperature 200° and 300° will be calculated and then expense at 236° found by interpolation.

Temperature	200°	300°
Member I	6.64	7.18
Member II	18.96	20.08
Member III	$5.77\times1.49=$ 8.60	$5.77\times1.87=$10.79
The sum	34.20	37.99

For $t^\circ = 236$°C we obtain:

$$34.20+(37.99-34.20)\cdot\frac{36}{100}=35.56\%$$

And for the heat of combustion 5608 cal.:

$$\frac{35.56\times 7500}{5608}=47.63\%$$ instead of 48.06%

TABLE IIa

THE VALUES OF MEMBER II (Wet Process)

t° = the temperature of waste gases, $h\%$ = content of water

t° = / $h\%$	100	200	300	400	500°C
30	6.33	7.06	7.86	8.78	9.79
31	6.63	7.40	8.24	9.20	10.26
32	6.95	7.75	8.64	9.64	10.75
33	7.27	8.11	9.04	10.09	11.25
34	7.60	8.48	9.45	10.55	11.77
35	7.95	8.87	9.88	11.03	12.30
36	8.30	9.26	10.32	11.52	12.85
37	8.67	9.67	10.78	12.03	13.41
38	9.05	10.09	11.25	12.55	14.00
39	9.44	10.52	11.73	13.10	14.60
40	9.84	10.98	12.23	13.66	15.22
t° = / $h\%$	100	200	300	400	500°C
41	10.26	11.44	12.75	14.23	15.87
42	10.69	11.92	13.29	14.83	16.54
43	11.13	12.43	13.84	15.45	17.23
44	11.60	12.93	14.42	16.09	17.94
45	12.08	13.47	15.01	16.76	18.68
46	12.57	14.02	15.63	17.45	19.45
47	13.09	14.60	16.27	18.17	20.25
48	13.62	15.20	16.94	18.91	21.08
49	14.18	15.82	17.63	19.68	21.94
50	14.76	16.46	18.35	20.48	22.84
60	22.14	24.69	27.52	30.78	34.25

TABLE IIb

THE VALUES OF MEMBER II (Dry Process)

t° = the temperature of waste gases, $h\%$ = content of water

t° = / $h\%$	500	600	700	800	900	1000°C
5	1.20	1.34	1.51	1.70	1.92	2.18
6	1.46	1.63	1.83	2.06	2.32	2.64
7	1.72	1.92	2.16	2.43	2.74	3.12
t° = / $h\%$	500	600	700	800	900	1000°C
8	1.99	2.22	2.49	2.81	3.17	3.60
9	2.26	2.53	2.83	3.19	3.60	4.09
10	2.54	2.84	3.18	3.58	4.05	4.60

TABLE I

THE VALUES OF THE FIRST MEMBER

t° = the temperature of waste gases

t° =	100	200	300	400	500	600	700	800	900	1000°C
I member =	6.17	6.64	7.18	7.78	3.46	9.24	10.14	11.19	12.40	13.82

TABLE III

THE VALUES OF MEMBER III AT $\frac{S}{d.B}=1$

t° = the temperature of waste gases

t° =	100	200	300	400	500	600	700	800	900	1000°C
Member III	1.12	1.49	1.87	2.31	2.79	3.33	3.94	4.65	5.45	6.39

American Lime and Stone Co's Plants at Union Furnace, Penn.

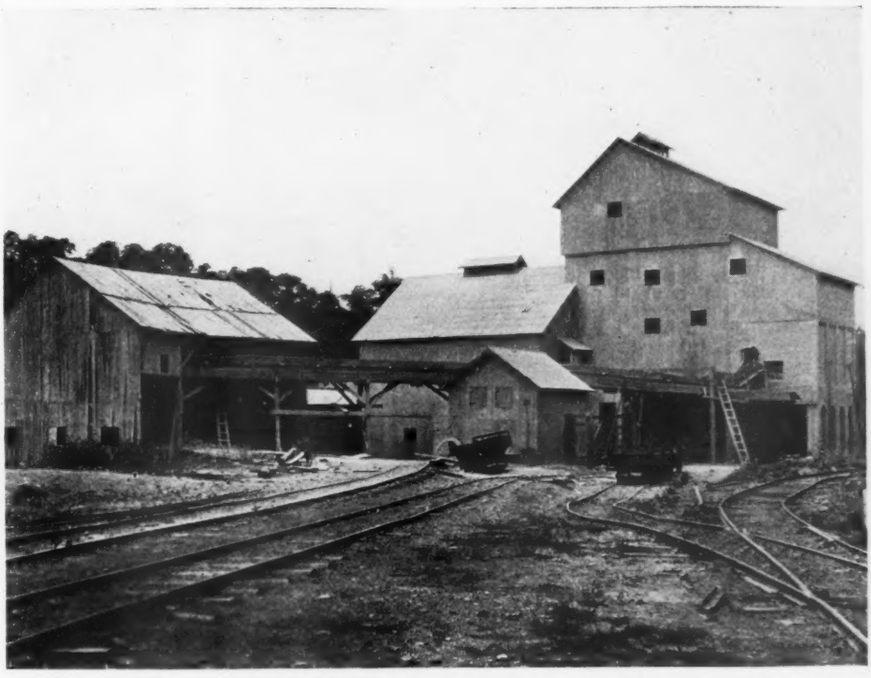
Two Plants Standing Side by Side in Which Widely Differing Methods are Used

THE big producer of lime and crushed stone in central Pennsylvania is the American Lime and Stone Co., which operates a number of plants. Three of these are at Union Furnace, which is not far from Tyrone, Penn., and they are known as Pemberton No. 1, No. 2 and No. 3. No. 3 was not operating when it was visited by a ROCK PRODUCTS editor, but the No. 1 and the No. 2 plants were going strong, the first producing 3000 tons daily of crushed stone in the ordinary commercial sizes and the second a lesser tonnage of flux stone, with some commercial crushed stone that was made from the undersize of the flux stone screen.

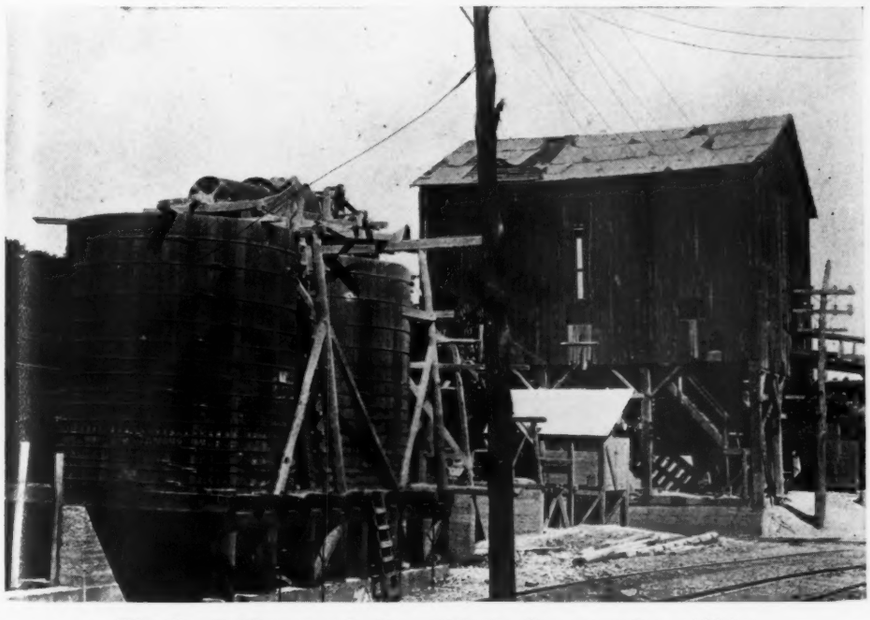
The quarries are situated some 300 yd. apart. Both deposits are of high-calcium stone and both carry exceptionally high faces. At No. 1 quarry the face is 156 ft. high and at No. 2 quarry, 180 ft. high. Steam shovels are used for loading in No. 1 and hand loading is the practice in No. 2. There is no true quarry floor in either, in the sense the word is used where the strata are horizontal. The strata in these quarries are parts of great folds so that they stand almost vertical. The floor is made by clearing off the inequalities left in blasting and levelling it so that tracks for the quarry cars may be laid.

Drilling and blasting practice is the same in both quarries. Holes are put down 22 ft. apart and 35 ft. back from the face. They are carried from 5 to 10 ft. below the floor level to prevent the formation of toes; du Pont 40% powder is used. The rock breaks well and a recovery of 6½ tons of rock per pound of powder may be counted upon, and this includes the powder used in block holing and mud capping for breaking the larger lumps.

At No. 1 quarry a Marion 36 and a type B Erie shovel are used to load Easton cars of the 7-ton heavy duty quarry type, which are hauled to the plant by Porter locomotives, where they are dumped into the receiving hopper with a Curtis air hoist. This hoist is of the vertical pendant design but was installed in a horizontal position to obtain a greater freedom of movement. It functions most satisfactorily by means of a cable attached to piston and passing over a sheave.



American Lime and Stone Co.'s No. 1 plant from the quarry side



The No. 2 (flux stone) plant with the fine screening addition

A gate from this bin opens to a 42-in. pan conveyor which serves as a feeder to the primary crusher, lifting the rock to a small hopper just over the mouth of the crusher.

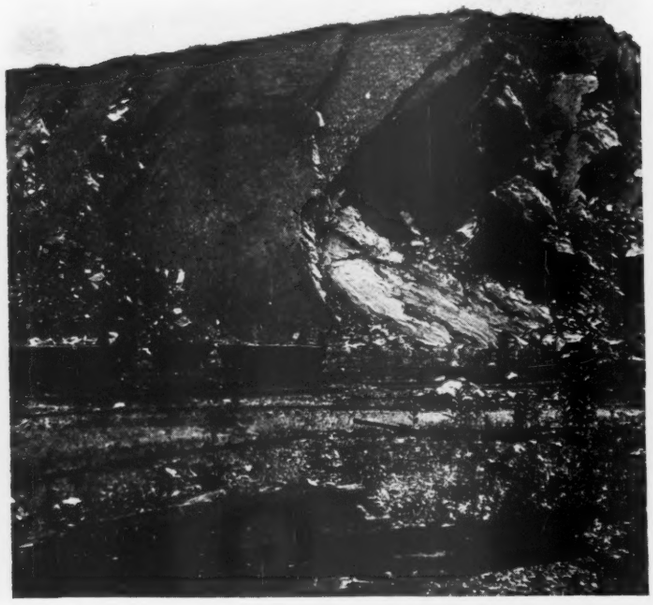
This is a 42x40-in. Worthington Superior jaw crusher with water-cooled bearings. All the rock goes through it and into the boot of a 42-in. close connected bucket and belt elevator which lifts it to the scalping screen. This is at the highest point in the plant. It is of an unusual type for it is made of flat iron bars 1½ in. wide and ¼-in. thick bolted to an angle iron frame. These are also

bolted together so that they form a mesh work of 3x4-in. holes. The greater part of the primary crusher product passes through these holes.

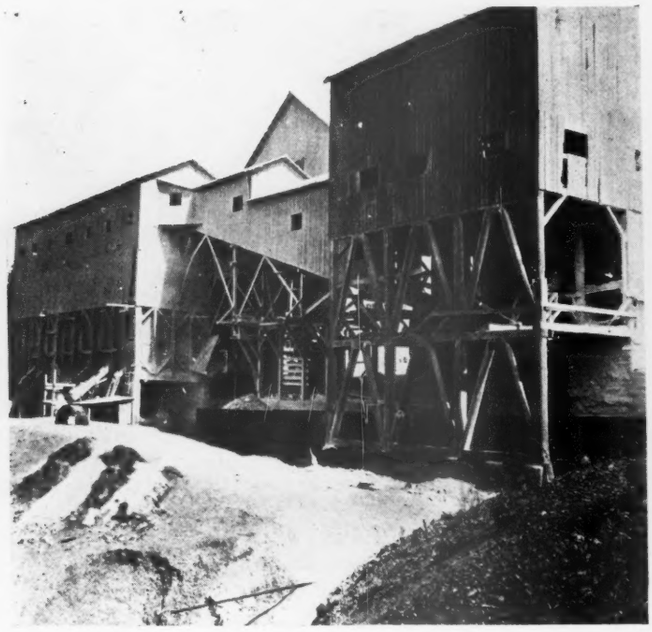
What does not pass goes by a long conveyor to the secondary crushing house in crusher it goes by a conveyor belt to the main sizing screen. The undersize of the scalping screen also goes to this sizing screen but by a separate belt.

The main section of this sizing screen is 60 in. in diameter and 24 ft. long. This goes by a bucket and belt elevator back to the main sizing screen.

The undersize of the ¾-in. holes of the sizing screen is elevated to the fine screen which is covered with wire mesh cloth. It makes two products, one between ¾-in. and



Left—No. 1 quarry. In both quarries the strata stand almost vertical. Right—Steam shovel loading in No. 1 quarry



Left—Loading bins at No. 1 plant. Right—No. 2 quarry in which the cars ae loaded by hand

which is a No. 7½ Gates-type gyratory crusher. This was originally the primary crusher of the plant and tracks and car dump are in place so that it might be used again for that purpose.

The crushing is so nearly completed by the primary jaw crusher that the amount of oversize going to the secondary crusher is comparatively small. After passing the section has 3-in., 2-in. and 1½-in. r.h. perforations. The jacket has 1-in. and ¾-in. perforations. All the products of this screen except the oversize of the 3-in. holes and the undersize of the ¾-in. holes (which contains everything finer than ¾-in.) go to bins.

The oversize goes to a No. 4 Austin gyratory crusher and the product of this crusher ⅝-in. which is in considerable demand in this section for concrete aggregate, and the undersize of ⅝-in., including all finer sizes, which is sold for road dressing.

A 200-hp. General Electric motor drives the jaw crusher and two 50 hp. motors of the same make drive the No. 7½ Gates and the No. 4 Austin gyratories.

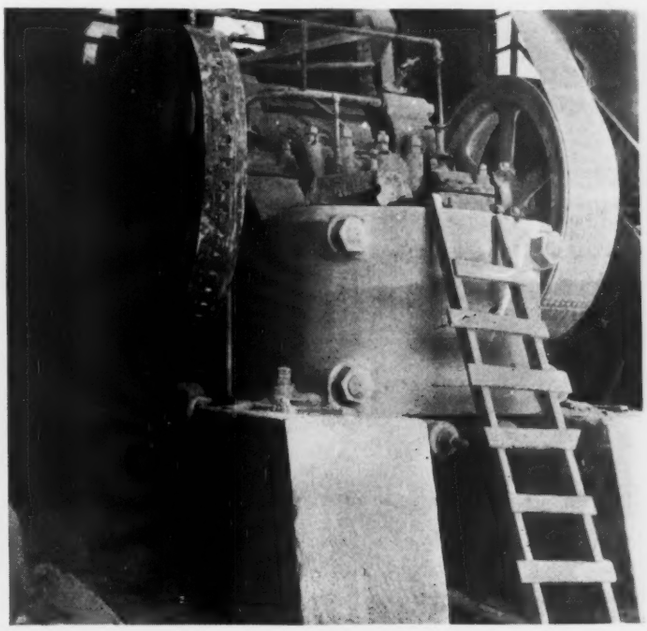
In the No. 2 quarry hand loading is prac-

ticed so the floor of the quarry is covered with the usual radial tracks. These converge at the bottom of an incline up which the cars are drawn by a friction hoist. They are dumped by the same arrangement as that spoken of in the description of the No. 1 with 1¾-in. round holes. All the oversize goes to the flux stone bin but the undersize goes to a separate screening plant for sizing.

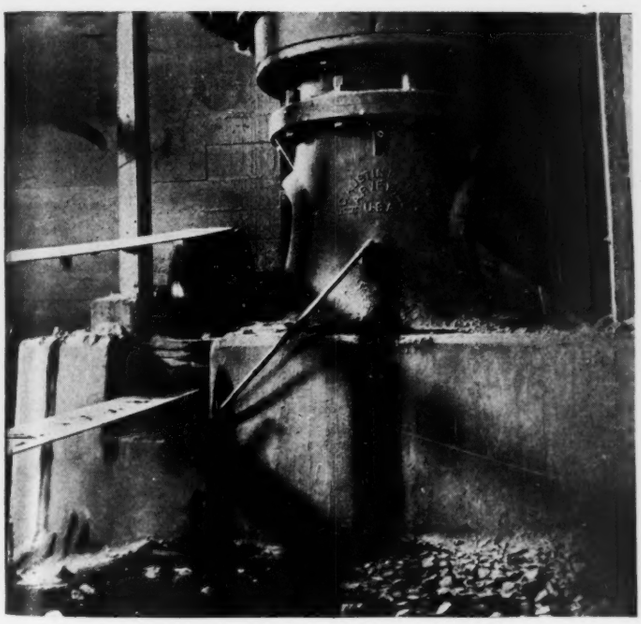
Originally this undersize was shipped to the No. 1 plant for sizing. But it was found cheaper to erect a small screening installation at the No. 2 plant and this is so unique that it is worth describing.

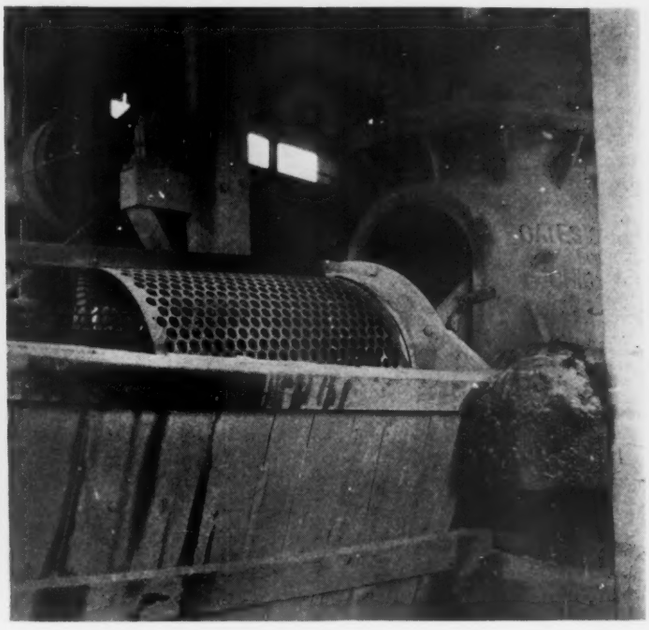
Two unused water tanks are set on concrete and timber supports over a track on which cars may be run under the tanks for loading. On top of these is a screen to which the undersize of the flux stone screen is brought by an inclined conveyor belt. Only two products are made, stone from ¾-in. to ⅝-in. and minus ⅝-in. road dressing.

The American Lime and Stone Co. is one of the largest rock products organizations in the United States. Its main office is at Bellefonte, Penn. All of its officers are men well known in connection with the rock products industries. Charles Warner is president, J. King McLanahan, Jr., and Alfred D. Warner, Jr., are vice-presidents, and Samuel M. Shallcross is vice-president and general manager. George C. Bingaman is treasurer and Charles C. Bye is secretary. W. R. Cliffe is general superintendent of all



Left—The pan conveyor feeding to the primary crusher. Right—The primary crusher, which is of the jaw type, with a 42x40-in. opening

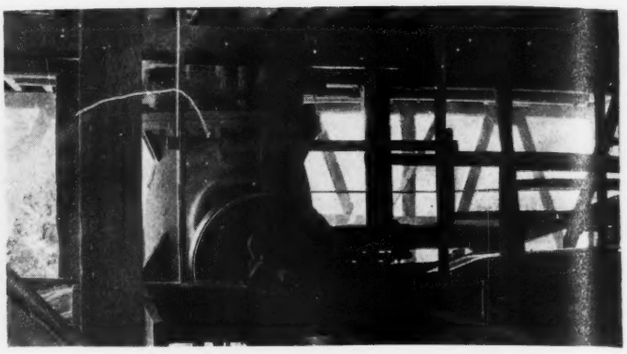




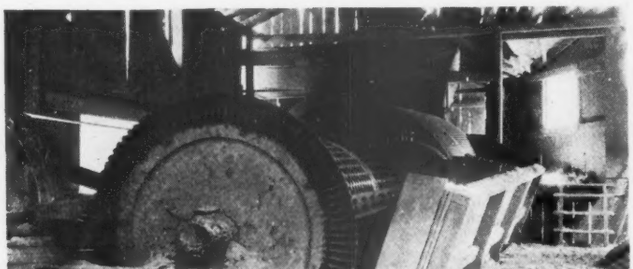
Left—One of the secondary crushers of the No. 1 plant. Right—The simple arrangement of crusher and screen in the No. 2 plant, which is all that is needed for producing flux stone

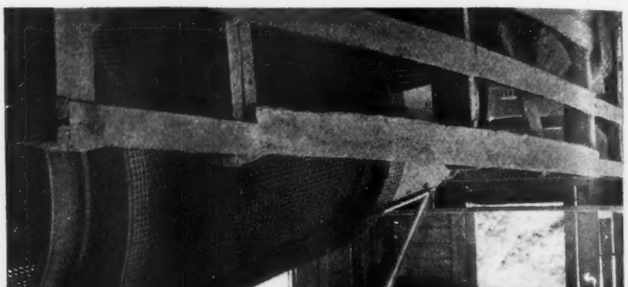
plant to a small hopper above the single crusher that the plant contains, a No. 7½ Gates-type gyratory.

This plant puts almost all of its output into a single product—flux stone—so it is very simple in its arrangements. The crusher product goes directly into a screen with only one section, which is perforated



Left—The secondary crusher at No. 1 plant may be used as a primary crusher. Right—One of the secondary crushers at No. 1 plant





Left—The main sizing screen at No. 1 plant. Right—Fine screen at No. 1 plant

plants in the southern division. H. W. Sheffer is general superintendent of the Bellefonte plants.

Enough Concrete to Build Thirty-Four Pyramids in One Year

FIGURES obtained by the writer from the cement industry show that for every automobile manufactured this year, three cubic yards of concrete will have been laid in highway construction.

The cubic yards of concrete used in highway laying will approximate 12,149,000 by December 31.

This is roughly equal to four times the cubic volume of the great pyramid.

One of the world's greatest reporters, Mr. Herodotus, was told by the Boosters' club of the Memphis of his day that the construction of that great pile required the labor of 100,000 slaves for 20 years.

And that it was not an expensive job, as a boy could be raised to manhood in the Egypt of that time for about $40, according to some estimates.

Each slave laid the equivalent of 30 cubic yards in 20 years. On a modern concrete job five cubic yards are laid for every man in the crew in a working day of ten hours.

But of course the concrete crew have back of them an elaborate railway plant and personnel, modern mining and quarrying equipment, and a cement manufacturing industry which will turn out 155,000,000 barrels this year.

On a masonry job we should hardly find that an American workingman could do in six days as much as an Egyptian in two decades, but we don't have to use masonry.

Estimating 1½ barrels of cement to the cubic yard of concrete, the total of all concrete work in the country this year will run to 103,000,000 cubic yards, the equivalent of 34 pyramids and only 14,000,000 cubic yards short of the great wall of China at its greatest extent.

Could Build the Great Wall of China of Concrete in 80 Days

Comparing the Chinese tradition of the building of the great wall with Herodotus' story, suggests that the Chinese were faster workers or else used a far greater multitude of men. Emperor Chin Huang Ti is said to have put 300,000 soldiers on the job, assisted by convicts and all the dishonest officials he could round up. In 15 years the wall was built.

It is almost enough to make one suspect that the Chinese had already invented Volsteadism, to have been able to get such a supply of labor from the ranks of officialdom. So far as known Chinese scholars do not claim that invention—but a lyric in the Prince of Pilsen rather intimates that they invented everything except sauerkraut.

However, under strictly modern conditions the 300,000 troops could have mixed and laid enough concrete to build the wall in 80 days.—*Harper Leech in Chicago Tribune.*

Crushed Stone Company To Try Natural Hydraulic Stripping

AN experiment is being made by the Bethany Crushed Stone Co. of Bethany, Mo., which, if successful, will result in a considerable saving in the cost of removing surface dirt that covers the ledge of Bethany falls limestone that is being quarried.

A new channel is being ditched for a part of the branch that runs west of the rock pit and empties within a few more yards into a creek. This channel will take a straight line to the creek, or a spot near it, and will supplement the regular channel. With these two running as parallel lines, lateral channels are being made to connect the two long ones, leaving sections of dirt between them.

The idea is that, the dirt being soft and sandy, the water that comes down the branch stream when it rains heavily will wash away the squares of land between the channels, carrying it into the creek to finally enrich with its silt some bottom farms farther down the larger stream, and leaving the limestone rock bared.

A dam is being erected across the regular channel of the branch to throw the water into the artificial long channel and widen and deepen it.

The plan bears more than ordinary promise because the branch, known as Buck's branch, becomes a raging torrent for a half hour after every heavy rain.—*Bethany (Mo.) Republican.*

Pumping and Washing Sand in Florida

Hydraulic Classification Used to Eliminate Fine Sands

By J. R. Thoenen
Mining Engineer, Greenville, Ohio

THE importance of the sand and gravel industry in Florida is emphasized by the production reports as given in 15th and 16th annual reports of the Florida Geological Survey in short tons and value as follows:

	Tons	Value
1921	160,445	$97,324.00
1922	246,849	147,924.00
1923	513,245	290,082.00

Figures are not available differentiating sand from gravel production, but the increase for sand alone is probably proportional to the total as given above. Florida sands are produced from various sources and by various methods, but the greater proportion is derived either from sedimentary beds of fairly uniform purity, both as to chemical content and physical characteristics, or as a byproduct from the recovery of kaolin, which is mined to make china clay. In the latter case the tailings from the classifiers of the clay preparation plants consist of clean, coarse, white quartz sands which are in marketable condition as produced owing to the washing they have undergone in the recovery of the clay. These are pumped from the tailings piles and shipped to market without further preparation. In the former case the sands are recovered from natural deposits of sedimentary sand of such purity and uniformity as to be usable without much preparation.

The pit of the Diamond Sand Co. near Lake Wales is a typical example of the recovery from natural beds without previous treatment. The deposit worked by this company is found overlying limestone with little overburden. Such overburden as exists consists of an inferior grade of sand and loam which is easily eliminated in the course of the recovery. The bed averages about 35 ft. in thickness. The surface is practically level, authough the top of the underlying limestone is quite irregular owing to previous erosion. The sand consists of coarse to fine white quartz particles with occasional interstratified beds of yellow sand. No attempt is made to separate the various beds and the whole depth of deposit is mined and sent to the washery.

The method of excavating is by means of hydraulic monitors by which the bank is cut down and washed to a central pit where it is picked up by a sand pump and elevated to the washing plant, where it is classified and the finer sand is eliminated and sent to waste together with the small amount of clay and loam found in the surface mantle.

Washing plant of the Diamond Sand Co. near Lake Wales, Fla.

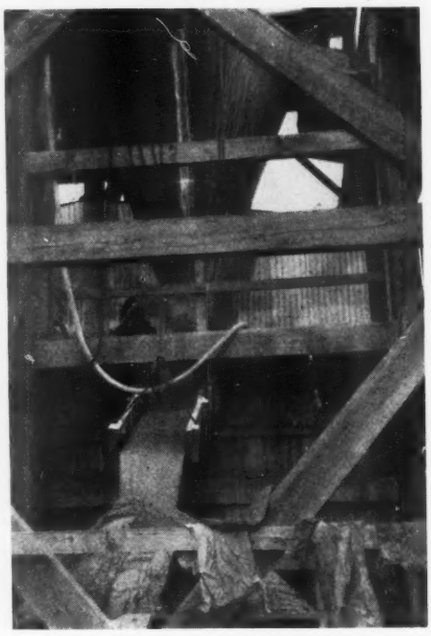
Left—A stream with 60-lb. pressure cuts down the bank. Right—Water and sand from sluicing run to this sump from which they are pumped to the washing plant

Water for the hydraulic monitors is obtained from a small nearby lake by an electrically driven single stage centrifugal pump delivering through a 10 in. pipe line to the side of the pit. At the pit the pipe is reduced to 2½ in. and connected to fabric fire hose of the same size at the end of which is attached a 1 in. nozzle. Water at the nozzle has a pressure of about 60 lb. per square inch. By manipulation of the nozzle the bank of the pit is gradually cut down and washed to a central sump which was previously excavated in the limestone.

The sand pump which sends the sand to the washing plant is an 8 in. single stage Georgia Iron Works centrifugal pump, direct connected to a 100 hp. General Electric motor running at 580 revolutions per minute on a 3 ph. 60 cy. 2200 v. alternating current supplied from Lake Wales. This pump elevates the sand and water from the sump and discharges through a 10 in. pipe line to the top of the washing plant which is located at one end of the pit. As can be seen in the accompanying illustrations, provision is made for raising and lowering the pump suction in order to remove roots and other debris which may accumulate in the sump by means of a wooden tripod and block and tackle.

At the washing plant the sand and water are discharged over a ¼ in.-mesh shaking screen, where any oversize lumps and roots are removed and sent to the waste pile. The undersize goes to the top of a 9-ft. steel sand cone or classifier. The disintegrating action of the water on the sand, both in the initial breaking down at the bank and in the transportation through the long discharge line from the sand pump, together with the final washing and agitation in the cone classifier, is sufficient to place in suspension all particles too fine for marketing as well as such loam and clay as is washed in from the surface mantle. The degree of separation can be regulated by the pressure and amount of wash water introduced at the apex of the classifier. The coarser sand settles through this ascending current of added wash water and is discharged continuously through a trap at the bottom or apex of the cone, together with a sufficient amount of water to prevent clogging in the chutes to the railway cars.

From the above description it can be seen that the treatment in the washing plant is



Automatic sand cone with rising current water which classifies the sand

one of classification or hydraulic sizing as well as washing, both operations being carried on simultaneously in the cone.

The fine sand and loam are carried out over the lip of the cone and discharged through launders to waste on the surface. The water from this waste material finally finds its way back to the small lake from which it is again pumped to the sand pit.

The coarse sand from the cone discharge is allowed to flow through chutes direct to open-top gondolas. The conveying water drains off and is absorbed in the sandy soil.

The plant is operated day and night on two 12-hour shifts and produces an average of 1500 tons daily with eight men on each shift.

Nearby property has been acquired by citizens of Lakeland and the Lake Wales Concrete Sand Co. formed. This company first thoroughly prospected their ground by means of drill holes from which they estimate a deposit of at least 5,000,000 yd. of clean white quartz sand with no clay or yellow material to contaminate it. Machinery has been ordered and grade constructed for a railway spur to serve the proposed plant.

The average of 11 screen analyses taken from the drill holes on this property gave the following results

Passing 4 mesh and retained on 20 mesh	17.0%
Passing 20 mesh and retained on 100 mesh	81.2%
Passing 100 mesh	1.8%

From the above analysis and the clean quartz character of the sand it would seem that this product would have considerable merit as a silica sand should a market be available for such use.

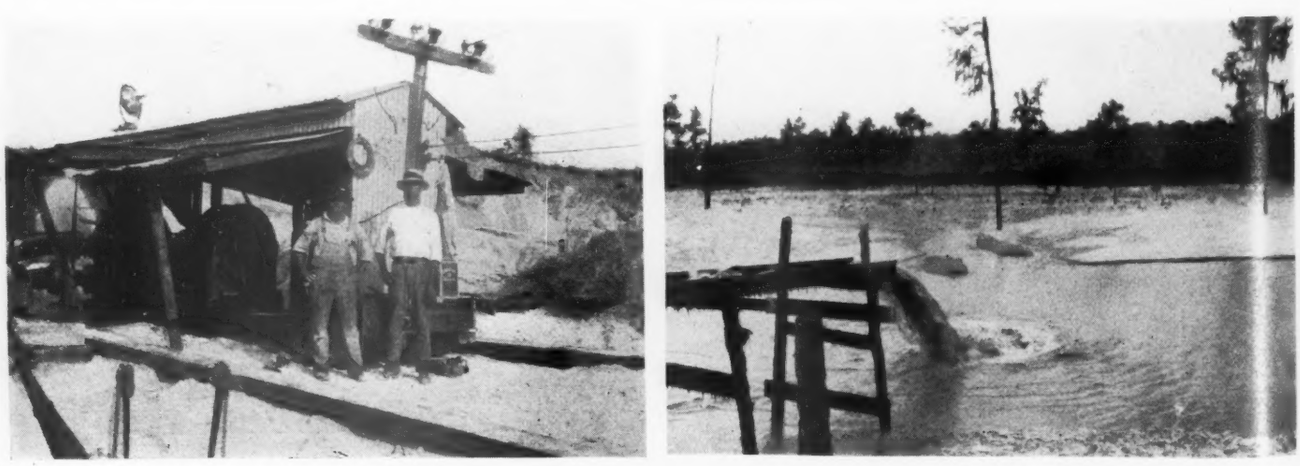
Iroquois Sand and Gravel Company Starts Operation

THE recently formed Iroquois Sand and Gravel Co. (incorporation reported in October 3 issue) has already started operation. A permit has been obtained from the government for the removal of sand and gravel from the bottom of the Iroquois river.

The new sand and gravel industry is located on the banks of the Iroquois river near the L'Erable bridge. It is the revival of an industry which was successfully operated several years ago, but was later abandoned.

The bed of sand and gravel is said to be of high quality and forms the river bed, extending several miles in length. It is thought when operations are properly developed, this may become one of the leading industries of the county.

The new company was organized by D. M. Meents, of Clifton, and David R. Ellis, of Chicago. Loveridge Martin, of Watseka, is associated with the company.—*Danville (Ill.) News.*



Left—The pumping plant. Right—Tailings pond to which the unwanted fine sands are pumped

Panorama of the Belmont Gurnee Stone Co.'s quarry at North Bergen, N. J.

A Remodeled Trap Rock Crushing Plant

The Belmont Gurnee Stone Company Enlarges the Production Facilities at Its North Bergen Quarry

BACK in 1905, the Belmont Gurnee Stone Co. started operation of its first crushing plant located at North Bergen, N. J. The stone, a hard trap rock, which is used for highway and building construction, was originally prepared for the market by a Bacon-Farrel 9x15-in. jaw crusher which had a capacity of 50 to 60 yd. a day.

The stone found a ready market with a steadily increasing demand. This demand necessitated changes from time to time looking to increased production and improved methods.

Early in 1925 the plant was completely remodeled by Earle C. Bacon, Inc., engineers, with offices at 26 Cortland street, New York City. At this time the plant was changed over from steam to electric drive, the power being purchased from the Public Service Co. of New Jersey.

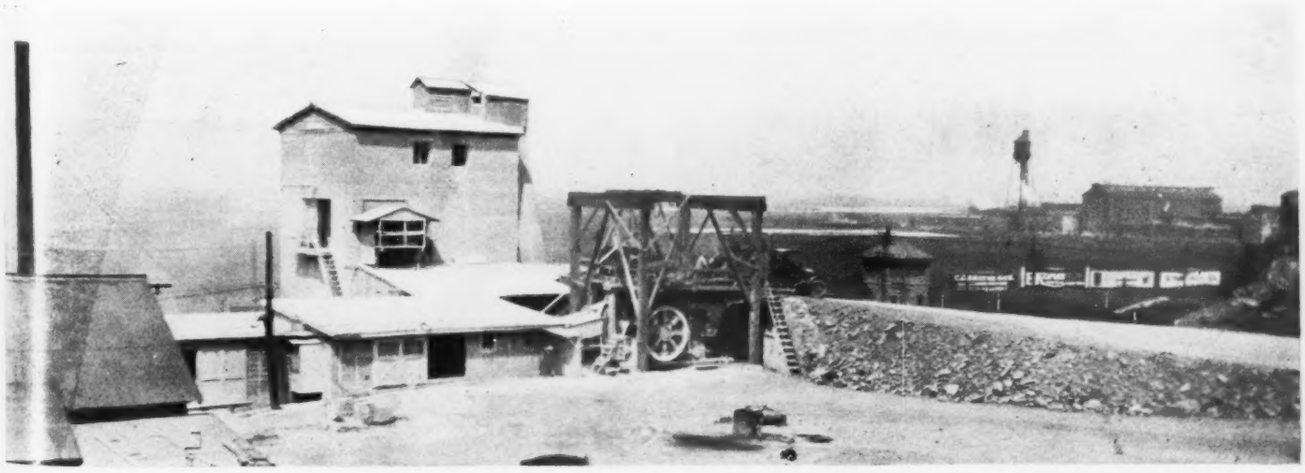
Today, the North Bergen plant of the Belmont Gurnee Stone Co. is a model of efficiency, producing 125,000 tons of crushed trap rock annually. In addition it is neat as a pin from office to quarry floor.

The deposit consists of 21 acres of hard trap rock. The quarry is semi-circular in shape and cuts into a hillside, the quarry face rising to an average height of 100 ft. There is very little overburden, and any necessary stripping is accomplished by hand shovel loading into motor trucks.

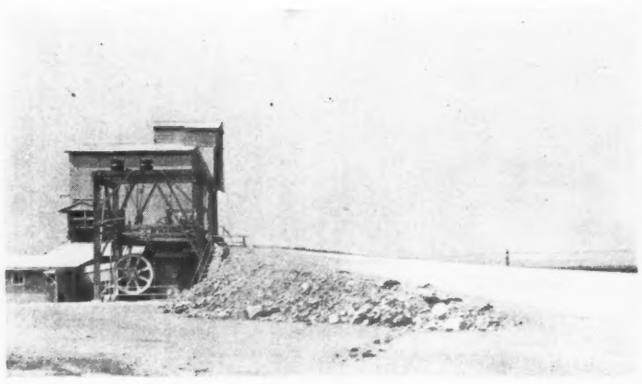
In blasting 6-in. holes spaced 15 ft. apart and set back 20 ft. from the face are put down by a Sanderson-Cyclone well drill to a depth of 5 ft. below the level of the quarry floor. Sixty per cent blasting gelatine is used and four or five holes are shot at the same time. Ingersoll-Rand X-70 and Cleveland jackhammers prepare the holes for secondary blasting, air being furnished by an Ingersoll Rand compressor driven by 110 hp. General Electric synchronous motor.

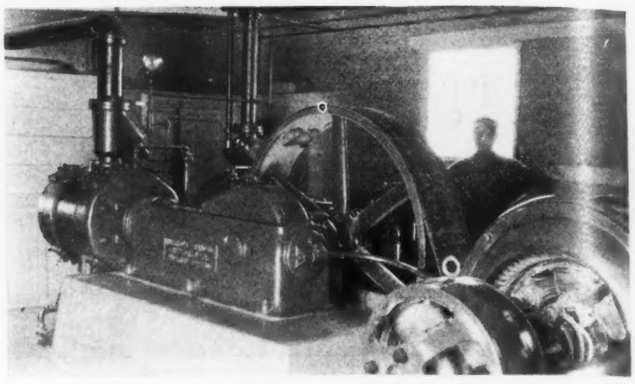
After blasting, the rock is loaded into 5-ton Pierce-Arrow motor trucks by a Marion Model 37 electric shovel having a 1¾ yd. bucket. The quarry floor is as smooth as the proverbial billiard table and it seems an easy matter for the three Pierce-Arrow trucks employed in this service to truck the stone away and up the incline to the top of the primary crusher.

A Bacon-Farrel 60x42-in. jaw crusher is used for primary breaking. It is driven by a 150 hp. General Electric induction motor and has a capacity of 3000 yd. per day. The crusher receives stone as large as the shovel can handle. Originally it was intended for "sledging," but because of its deep frame it is able to break the hard trap rock to 4-in. size and under in one operation, thus considerably relieving the rejection crushers.



The crushing plant, which is served by trucks from the quarry instead of the usual cars. Note the incline at the left, up which the trucks bring the stone





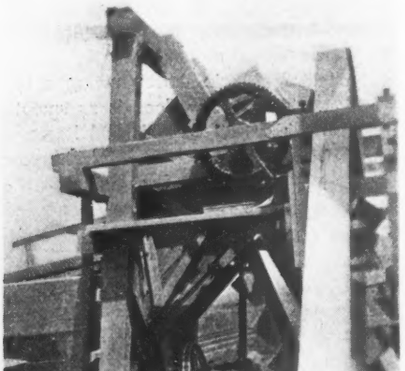
Left—A view taken to show the pitch of the quarry incline. Right—Air compressor driven by synchronous motor

The stone is elevated from the primary crusher to a Bacon 15 ft. by 60 in. scalping screen, both elevator and screen being driven by a 50 hp. General Electric induction motor. The 1½-in. stone is here separated and transferred through a chute to the main elevator, which carries it to the sizing screen to the top of the bins. The oversize drops from the scalping screen directly into a 36x24-in. Bacon-Farrel crusher, where it is recrushed and thence passes by way of the main elevator to the sizing screen. This is a 48-in. Bacon screen located just above the bins. Any size too large for the sale is rejected by this screen and sent back through chutes to the Reliance and Champion rejection crushers. These, together with the main elevator and the sizing screen, are driven by a 200 hp. General Electric induction motor located in the basement of an adjoining building which houses the power equipment. Stone, recrushed to the required sizes by the rejection crushers, again goes to the main elevator and so on through the sizing screen, whence it is discharged into four bins having a capacity of approximately 100 yd. each of 2½ in., 1½ in. and ¾ in. sizes and screenings. These bins have chutes in the bottom from which the material can be dropped directly into motor trucks for delivery.

Additional storage is provided outside by making use of a natural hillside. Material is loaded from outside storage directly into motor trucks by an Austin gasoline shovel having a ⅝-yd. bucket.

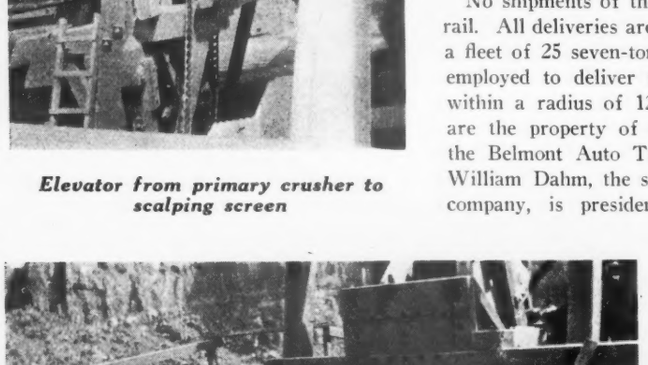
No shipments of the product are made by rail. All deliveries are made by motor truck, a fleet of 25 seven-ton Pierce-Arrows being employed to deliver the crushed trap rock within a radius of 12 miles. These trucks are the property of an auxiliary company, the Belmont Auto Trucking Co., of which William Dahm, the secretary of the quarry company, is president. A modern, well-equipped garage located at the plant houses the fleet and affords facilities for all minor repairs.

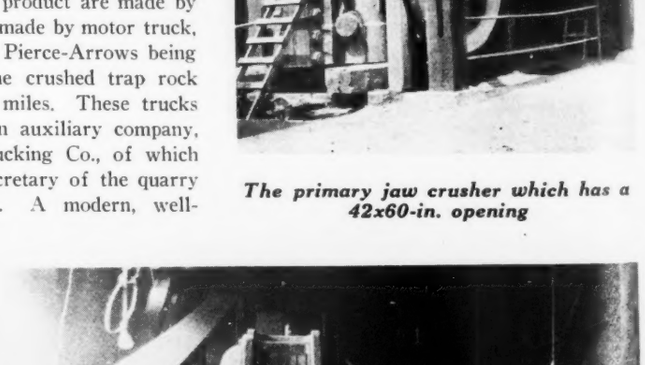
In addition to the North Bergen plant, the Belmont Gurnee Stone Co. operates three other crushed stone plants located at Alpine, N. J., Suffern, N. Y., and West Nyack, N. Y. They own, besides, a quarry at Mt.



Elevator from primary crusher to scalping screen

The primary jaw crusher which has a 42x60-in. opening





Left—The scalping screen. Right—The 200-hp. motor which drives the secondary crushers, the main elevator and the sizing screen

Ivy, N. Y., which is not at present being operated. Property of the company comprises in the aggregate about 400 acres of stone land in New York and New Jersey.

Officers of the company are: John J. McMahon, president; James McMahon, vice-president; William Dahm, secretary and treasurer; J. Hubbard Dahm, assistant secretary and treasurer. Thomas Donato is superintendent of the North Bergen plant.

Steam shovel loading broken trap rock in the quarry

First Sea Shipments of Gypsum Products to Florida

THE U. S. GYPSUM CO. of Chicago, Ill., is preparing the first unit sea-shipment of gypsum materials ever made from a North Atlantic port to Florida. Four of the company's northeastern mills are loading cars for shipment to Weehawken, N. J., where the materials will be loaded aboard the 2500-ton ocean barge *F. W. Fancher*, which will be towed to Miami, Fla., by the sea tug *Gypsum King*. Both vessels are owned by the company.

When the *Fancher* puts to sea this week it will carry materials for the finishing of more than 2,000,000 sq. ft. of wall space. Aboard will be 1,000,000 sq. ft. of fireproof gypsum wallboard, more than 500,000 sq. ft. of gypsum lath, 850 tons of hydrated finishing lime—sufficient to finish 600,000 sq. ft. of plastered wall—gypsum cement plaster, gaging plaster and molding plaster, besides wallboard finisher, colored stucco-finish and plastic paint to be used for interior decoration.

The trip is expected to take eight days and the cargo will be discharged at Miami. Then the *Fancher* will be towed to New Orleans and will be put into twice-a-month service to Miami, St. Petersburg, Tampa, Key West and Jacksonville. Cargoes will be made up of all the gypsum structural materials needed by the Florida builders. These materials will be shipped into New Orleans by rail from the plants of the United States Gypsum Co. at Sweetwater, Texas, and Southard and Eldorado, Okla.—*New Orleans (La.) Tribune.*

Nevada Corporation Formed to Work Siliceous Earth Deposits

THE American Geyserite Corp., Reno, Nev., has been formed by a group of business men in or about Reno to develop a deposit of siliceous earth and marl at Wahoe County, Nevada. The new corporation has acquired title to about 800 acres, all contiguous of such deposits. Among the minerals said to be present are so-called vegetable earths (natural clays), different grades of abrasive sands, silica sands for fillers in the paint and soap industry, pumice, fullers earth, a blue silicate said to be suitable for glazing china ware, making spark plugs, etc., and an exceptionally large deposit of alunogen in colloidal clay which is a sulphate of alumina.

William Dahm, secretary and treasurer of the Belmont Gurnee Stone Co.

The development of the project will be by degrees with only two of the commodities to be removed at present, as the company is not able to fully handle the entire deposit. The material is said to lie in large domes, thus making their removal an entire surface steam shovel operation.

The total authorized capital is $300,000, of which $120,000 is in treasury preferred stock unsold. The officers and the directors are: G. B. Wright, president; W. H. Kirk and J. S. Finch, vice-presidents; A. E. Lasher, treasurer; E. R. Simmins, secretary, and H. M. Moser and C. P. Johnson, directors.

Bureau of Mines Investigating Safety Work and Rock Dusting of Mines

THE recent annual report of the director of the Bureau of Mines to the Secretary of the Interior covering the period prior to the transfer of the bureau to the Department of Commerce has just been issued. The many experimental stations of the bureau spread throughout the country have devoted themselves to the solution of problems which are of interest and value to the industry of the sections they are in.

The wide scope of the bureau's research includes mine rescue and first aid instruction, preventive methods for elimination of coal dust explosions in coal mines, health surveys, fuel saving in different industries, analyses on solid, liquid, and gaseous fuels, smoke nuisance problems, conservation of fuels, utilization of manganiferous ores, chemical processes and metallurgical operations, new alloys, cracking processes for heavy oils and tars, and many other things.

Of chief interest to rock products industries is the recently organized safety extension service to give advanced training in rescue work and bring to the attention of mine officials the latest advances made in the prevention of mine fires and explosions and in the conduct of rescue operations and disasters. Approximately 140,000 workers in the mineral industries have already been trained in mine rescue and first aid methods by employes of the Bureau of Mines. The bureau has also devised methods for the use of dolomite as a substitute for magnesite in the making of refractory brick and contributed greatly to the development of more resistant refractories.

The bureau is continuing the investigation of the explosibility of the dusts of different coals, the ways in which mine gases or dusts may be ignited, and the manner in which an explosion traverses mine workings. Following a series of tests at the bureau's experimental coal mine, which have demonstrated how widely spread coal-dust explosions could be prevented by coating the walls, roof, and floor of mine passages with rock dust, operators of bituminous mines in different parts of the country are rock dusting their mines. One state now requires that rock dust be used in all coal mines, and several states specify its use as an alternate to watering the mine. Co-operation with the British Department of Mines, directed more immediately toward research on the betterment of mine explosives, the use of electrical equipment in mines, and the best methods of preventing the propagation of explosions, was continued during the year.

Other investigations carried on recently by the Bureau of Mines have to do with the study of oil shales (for which a pilot plant is to be built), the uses of diatomaceous earth and various other subjects connected with the rock products industries. Notices will be published from time to time.

Hints and Helps for Superintendents

A Bridge Made of Old Boiler Tubes

MANY uses of old pipe have been shown in these pages, but the one shown here is perhaps as novel as any. It is an automobile bridge made of old boiler tubes which is on the road leading into the plant of the Potts-Moore Sand and Gravel Co., at Waco, Texas.

An automobile bridge made of old boiler tubes which cattle and horses will not cross. Wagons go through a gate and over a wooden bridge

The tubes are merely laid upon wooden stringers and spaced about 3 in. apart. Then two pieces of 2x8-in. stuff are laid on top and spiked through to the stringers. The stringers are notched slightly to hold the tubes in place.

An automobile can cross the bridge comfortably and so can a man on foot, by using one of the 2x8 pieces as a path. But stray cattle and horses will not attempt it, being afraid of the open spaces.

There is a wooden bridge with a floor that horses and wagons can cross, and a portion of this shows in the lower right hand corner. There is a gate in the wire fence shown to keep cattle from crossing this bridge. But it is seldom used, almost all travel being by automobile. The new bridge was put in to save the trouble of climbing out of the automobile and opening and shutting the gate when the old bridge was used.

Testing Sand for Shale

By P. M. HEGDAL
Engineer of Tests, North Dakota State Highway Commission

DURING the summer of 1924 the writer developed a test for determining the amount of shale in sand by the use of a lead acetate solution. The advantage of the method, which is described below, lies in the fact that a very heavy solution is obtained which is not sluggish or sirupy. This is a very desirable quality as the thick liquid, if sluggish, prevents all fine particles of the sand from subsiding regardless of their specific gravity.

The description of the lead acetate method follows:

To about 2 kilograms of ordinary commercial acetate (sugar of lead) add about 600 or 700 grams of distilled water. Boil in a glazed pan into the top of which a standard testing sieve will fit, until it is all dissolved. This solution must be kept over a flame or hot plate while the testing is being done as at ordinary temperatures it is a solid. It should be kept near the boiling point and its specific gravity should be kept about 2.40 (approximately) by boiling off water to increase, and by adding distilled water to decrease its weight.

Use that portion of a 500-gram sample of washed dried sand which is retained on a No. 50 sieve.

Sprinkle the sand to be tested into the hot solution, stirring in the floating sand. All the shale will float and can best be skimmed off with a spoon fashioned from a strip of 20-mesh brass screen 2 by 6 inches in size, which may be emptied by dipping it into a pan of hot water. The shale should then be washed in warm water till clearly dried and weighed, and the weight in grams divided by five gives the percentage of shale.

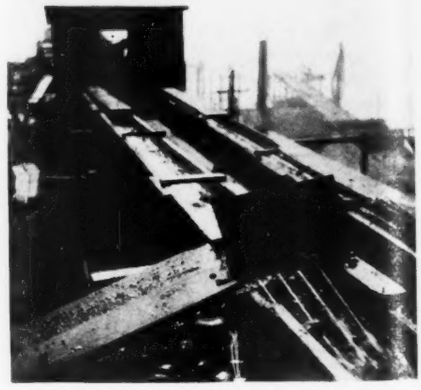
To recover the lead acetate, set a No. 50 sieve in the top of a second pan of the size mentioned above and dump the hot solution into the sieve. The sand will be retained on the sieve and can be removed from it by washing with warm water.

If crystalline C. P. lead acetate is used, heat it without the addition of water to prepare the solution.—*Roads and Streets.*

Sluice Screen for Removing Oversize

A SCREEN that depends upon the force of water to push the material to be screened uphill and over the screen is used in some plants on the Pacific Coast. It is shown in the lower right hand corner of the accompanying picture. The photograph had to be taken from above which makes it look as though the water was flowing uphill. The house at the top of the picture is considerably lower than the screen as the sluice has a 12½% grade (1½-in. to 1 ft.)

The screen is intended to take out pieces larger than 4 in. in diameter. These are



Sluice screen for removing oversize

sent to a crusher. It consists of 4 bars set in the sluice so that they have an inclination of about 30 deg. to the horizontal. The water comes down the sluice with considerable speed and the momentum is such that the

pieces that cannot go through the bars slide up on them until they strike a deflecting plate at the top. This is set at such an angle that they are deflected sidewise and fall into a hopper at the left hand side.

The screen was working when the picture was taken and a good many stones were being taken out. The motion was too quick to be caught by the shutter of the camera, but one stone may be seen on the bars and a number at the left which were falling from the deflecting plate into the hopper below.

This screen is in use at the plant of the Heney Gravel Co. on Vashon Island near Seattle, Wash. Several of these screens are in use at this plant and they require practically no attention. Occasionally a stone will wedge itself between the bars and the sluice will then run over until the stone is removed.

Protection for a Screen Shaft

SCREENS that have an interior shaft and spiders are subject to considerable wear. The point of greatest wear is on the shaft

This split cylinder protects the screen shaft

where the falling stones strike as they enter the screen. For the sake of lightness this shaft is often made of pipe and the falling stones will cut it through in a comparatively short time if the shaft is not protected.

Such a screen and shaft was in use at the Dell Rapids, S. D., plant of the Wisconsin Granite Co. and the shaft wore through and had to be replaced at least once every season.

Roy Johnson, the manager of the plant, thought he could prevent this and has had a hollow cylinder made of manganese steel that would cover the shaft at the point of wear. It is in two pieces which are bolted together like a clamp over the pipe and no other attachment is necessary.

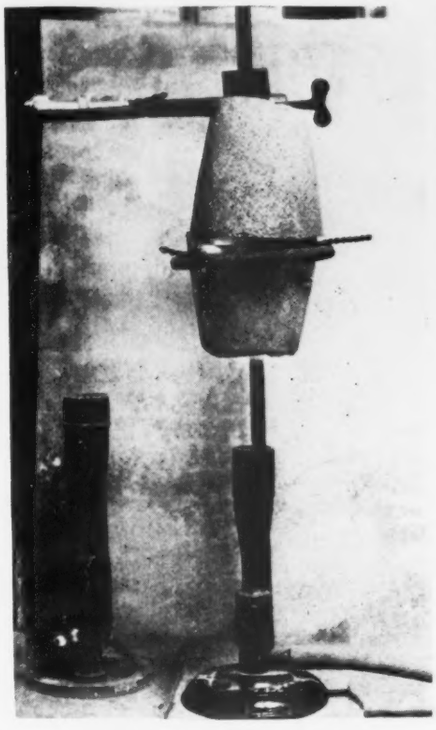
Since these were put on, the shaft has lasted for two seasons and from the small amount of wear shown by the protecting pieces it is probable that they will last for several seasons. A new set is ready to change as soon as these are worn, which is a much smaller task than changing the shaft, so the shaft will last indefinitely.

Substitute for Blast Lamp in Testing Limestone

LABORATORIES are often asked to make a burning test on limestone or similar rock and find they have not a blast lamp to give the high heat which is required. The picture shows how an ordinary bunsen burner may be used for the purpose. This was worked out by Dr. Warsap, the research chemist of the Blue Diamond Co. of Los Angeles, Calif., and it is so successful that he uses it altogether in his investigations.

A little furnace is made by cutting off the bottom of a 3-in. fireclay crucible and supporting it in a ring stand so that the bottom is 2½ in. above the top of the bunsen burner. Inside, a porcelain triangle holds a platinum crucible in which the rock to be burned is placed. Another crucible with the bottom cut out is placed above for a cover.

The bunsen burner is lighted and burned in the ordinary way until the little furnace



An ordinary Bunsen burner may be made to take the place of a blast lamp

is thoroughly heated. Then the gas is turned on slowly until the gas cock is wide open. As the gas is turned on the flame rises until all the combustion is in the little furnace. The heat is so intense that the rock may be brought to a white heat if required.

After combustion is established in the furnace the gas may be turned down a little to regulate the heat without the flame going back to the bunsen burner.

Splitting Rock in the Place of Block-Holing

AT the quarry of A. Courchesne, Inc., in El Paso, Texas, it has been found cheaper to split stones which are too heavy for a man to lift into a car than it is to break them with powder.

A hole 3 to 4 in. deep is drilled into the stone with a jackhammer drill just as if it were to be shot. But instead of loading the hole with powder the workman drives in a short bar of round steel which is tapered to about ¾-in. at the end. A few blows with a heavy sledge causes the rock to crack.

The stone showed in the picture weighed about 750 lb. and was broken into four or five pieces by four blows from a sledge. These pieces were easily loaded by one man into a quarry car.

This is an old-fashioned method but Mr.

Splitting the rock with a point may be cheaper than block holing

Courchesne says that it saves a few cents for powder cap and fuse on every large rock that has to be broken. He says that it also makes less fines than breaking with powder, which is of considerable importance in his work, as only the coarser pieces can be sold for flux-stone.

Mica in Wisconsin

SEVERAL large deposits of mica and soapstone, said to be of excellent grade have been found in Milladore, Wood county, Wisconsin. Quarrying operations have been started by a company organized in the eastern part of the state, and already more than 500 tons of the material have been shipped to Chicago.—*Milwaukee (Wis.) Journal.*

Notes from the Western Road Show

Rock Crushing and Gravel Washing Machinery at the San Francisco Exhibition

By Charles Geiger
San Francisco, Calif.

ONE of the outstanding features of the All Western Road Show held in San Francisco on the Marina November 9 to 14, was the extensive exhibits of rock crushing and crushed rock and sand and gravel handling equipment. In the exhibition tents as well as on the demonstration field this equipment was in operation during the entire week. The demonstration field was a large area in front of the exhibition tents where loaders demonstrated their loading ability by actually operating in the sand; a dragline was in operation, and several gasoline driven shovels and many other kinds of equipment. One of the most valuable features of the entire show was this demonstration field where every manufacturer had an equal chance to show his stuff. Two of the photos show some of the equipment on the demonstration field in actual operation. One shows an exhibitor actually demonstrating a loader designed particularly for loading sand and gravel and crushed rock from stock piles. The loading unit of the machine is a complete unit and entirely independent of the tractor to which it is attached by a steel frame which can be removed when the tractor is desired for other work.

Another picture shows the exhibit of the A. L. Young Machinery Co. of San Francisco, in which was displayed and operated a Haiss loader which is intended for loading crushed stone, sand and gravel from the pile and has a capacity of from one to two yards a minute. A new precision hopper with which the loader can be equipped enables the operator to measure materials accurately on any road job.

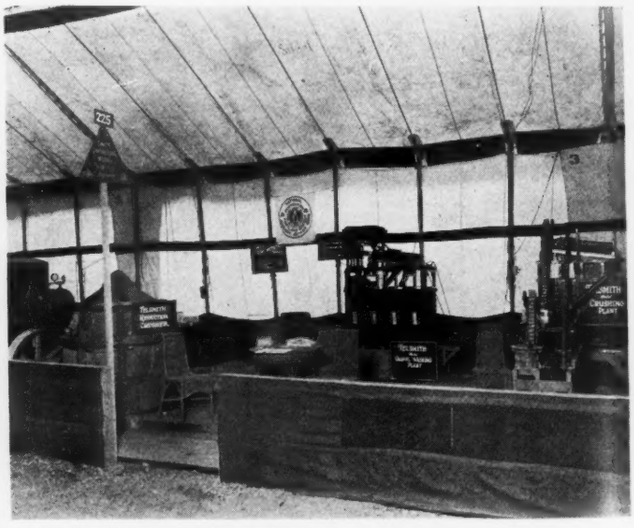
The interesting exhibit of the Traylor Engineering & Manufacturing Co. of Allentown, Penn., which was in charge of W. H. Agens, is shown in an illustration. This exhibit included a 6-in. Bull-Dog finishing crusher with full accessories and a shaft and head for 4½-in. finishing crusher. One photo in this booth showed the largest gyratory in the world, this being the 60-in. crusher installed at the Michigan Lime Stone and Chemical Co. plant at Rogers City, Mich.

In another booth was the exhibit of the Iowa Manufacturing Co. of Cedar Rapids, Iowa. This exhibit included a crusher unit for production of material for gravel and stone surfaced roads and a 9x36-in. reduction crusher.

A feature of the crushing and material handling exhibits of the Road Show was the large number of models, miniature editions of the real thing. Seasoned exhibitors are finding this a satisfactory way to tell their stories without going to the expense of transporting fifteen or twenty tons of machinery. And everybody likes to watch a working model.

At the Smith Engineering Works exhibit there was in actual operation a miniature gravel washing plant and a miniature crushing plant in which "little ones were made out of big ones." These models in charge of L. P. Waker (who came from the home factory) were the means of attracting a great deal of attention to the exhibit.

An interesting exhibit was a number of miniature material handling devices in actual operation in the exhibit of Smith-Booth-Usher Co. One was a Barber-Greene loader which elevated sand and deposited it into a miniature motor truck, the sand passing down through the dump bottom of the truck where it was picked up by a miniature conveyor which delivered it into a gondola car. Passing down through the drop bottom of the gondola the sand was picked up by another miniature conveyor and deposited on the table in front of the miniature loader, this operation of the sand continuing as long as the electric motors were operated. Near this was a miniature Sauerman Bros. scraper and cableway excavator. A brass lattice type mast 8 feet in height and equipped with all mast bands, sheeves, guy wires, slack line cables and other lines as used in the standard equipment was included. A miniature scraper of about ¼ cu. ft. capacity scraped up sand from a wooden box, raised and deposited it into an elevated bunker with grizzlies. After passing through the grizzlies the sand was returned by means of a miniature scraper to the point where it was again picked up by the ¼ cu. ft. scraper.



Views of booths showing both models and full-sized equipment

In the Smith-Booth-Usher exhibit there was in operation a miniature of a Clyde Iron Works double-drum hoist with sheeving gears and counterweight holding drum, mounted on a standard type stiff leg derrick complete in every detail with derrick iron and bullwheel.

A booth which educated the public in making good concrete

The Leahy No-blind vibrating screen which is used for screening crushed rock, sand and gravel, was operated in the booth of the Deister Concentrator Co. of Fort Wayne, Ind. This machine was demonstrated by C. A. Scott, general manager of the company.

In the Link-Belt exhibit there was in operation a Link-Belt vibrating screen for handling any material requiring accurate screening. This screen has an excellent method of spring suspension which prevents vibration from affecting the building.

One of the interesting features of the Road Show was the demonstration of rock drills by the various concerns manufacturing compressed-air equipment. All the manufacturers used granite blocks for demonstrating rock drills. The Chicago Pneumatic Tool Co. had a new model drifting drill mounted on a tripod which was demonstrated against the end of a big granite block.

At the Sullivan Machinery Co.'s exhibit compressed air for operating air drills was provided by means of a Sullivan 220-ft. portable compressor of the class W-K 314.

At the Ingersoll-Rand Co. exhibit an 8x6 type 20, 210 cu. ft. capacity compressor supplied compressed air for demonstrating tools.

At the Rix Compressed Air and Drill Co. booth air for operating the Coochise drills was supplied by a Rix 6 supercharger mounted on a truck.

The G. H. Williams Co., Erie, Penn., had the largest exhibit of clamshell buckets at the entire show, consisting of the Williams 1½-yd. Hercules bucket for extra hard service, 1½-yd. Williams Favorite for general rehandling, 1-yd. Favorite, ½-yd. Hercules with teeth and a 1-yd. Hercules with teeth.

Numerous and varied sales of almost every class and size of machinery exhibited at the Show was one of the outstanding features of the event. What was perhaps the largest single piece of equipment sold for use in the sand and gravel industry was a Northwest model 105 full Deisel Shovel. A photo shows the shovel in action on the demonstration field, which was immediately shipped to George Daley for use in a gravel pit near San Diego, Calif.

So attractive to the crowds at the Road Show were the model plants of the Smith Engineering Works that applications were made to L. P. Walker, in charge of the exhibit to have them shown at the Victory Highway Exposition in Reno next year and at the Orange Exposition at Riverside, Calif., this winter.

The All Western Road Show represents the cumulative efforts of an earnest group of men and organizations for more than a year past. It is the fruition of a long cherished dream to initiate an annual exposition in the West, for the West, that will record and help develop all legitimate highway projects.

In addition to the various activities at the Road Show a number of conventions were held during the week by various organizations. The Rock, Sand, and Gravel men of the West held their annual convention in the Convention Hall on the grounds Friday, November 13. J. G. V. Clarke of Los Angeles, was the presiding officer.

Left—The demonstration field. Right—One of the many wagon loaders exhibited

Newest Gypsum Plant on the West Coast

Standard Gypsum Company of Seattle Installs Equipment to Treat Gypsum Rock from Mexican Deposit

THE Standard Gypsum Co. of Seattle, Wash., recently consolidated with the Pacific Gypsum Co. and has built a plant in the southern part of Seattle. The pictures which accompany this were taken in the latter part of September when the plant was not quite completed.

The mine from which the plant will receive its supply of gypsum rock is on San Marcos Island, which is in the Gulf of California, in Mexico. The deposit, estimated to contain 100,000,000 tons, is so close to water that ships may be loaded directly from the mine. No stripping of the deposit is needed and the rock is exceptionally pure, analyzing 98% gypsum. It is being mined by what are known as "glory holes." A tunnel is first run into the rock and then raises put up from this tunnel to the surface. The rock is drilled and blasted around these raises, which serve to get the rock to the tunnel level and also for storage of broken rock. This system was adopted by the company because it is well adapted to Mexican conditions. The miners understand the work and it does away with heavy machinery which is expensive to maintain in such a distant part of the world.

On reaching Seattle the boats will be unloaded at the company's own dock by a 3-yd. Mead-Morrison clamshell bucket. This is handled by a derrick which sits on a heavy frame of timbers that can be moved along the dock on a track, thus making a gantry crane of the arrangement. A 30-in. Link-Belt conveyor (all the conveyors in the plant are of this make) 200 ft. between centers, receives the bucket discharge through a movable hopper and conveys it the length of the dock to the main conveyor that takes it to the storage shed.

This shed is 240 ft. long, 70 ft. wide and 40 ft. high to the conveyor gallery in the roof. In this runs the 30-in. conveyor, of 400 ft. centers that brings in the rock and distributes it. It is provided with a gravity take-up and a tripper of the self-propelling kind which distributes the rock the length of the bin. From 25,000 to 30,000 tons of rock can be carried in storage.

The rock is removed by another conveyor in a tunnel which is 18-in. wide and has 240 ft. centers. The feed to this belt is through 24 openings in the floor of the shed which allow the rock to run to chutes and feeders of a special design. These feeders are regulated by a man in the tunnel who will draw the bin contents so as to keep the storage even.

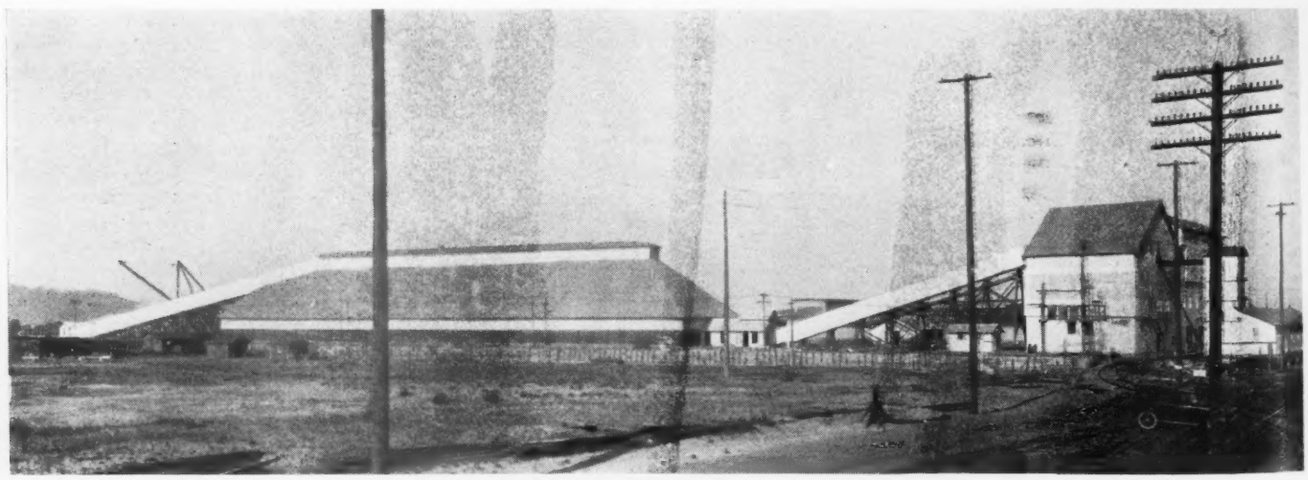
The rock is crushed at the mine in Mexico to pass a 3-in. ring as this makes it easy to handle in loading and unloading and it is a good size for conveying. As the climate of San Marcos Island is hot and almost without rainfall, the rock is very dry when it is mined and loaded. By keeping it under cover it is kept so dry that it may be sent to the crushers and calciners without being passed through mechanical dryers, as usually has to be done in gypsum plants.

The tunnel conveyor discharges to a bucket and belt elevator which lifts it to a feed hopper above a Butterworth and Low rotary crusher which has a capacity for 50 tons per hour. The crusher discharge goes by an 18-in. belt to the "pebble" bins of the plant. This part was not completed when the pictures were taken and the crusher foundations had just been poured.

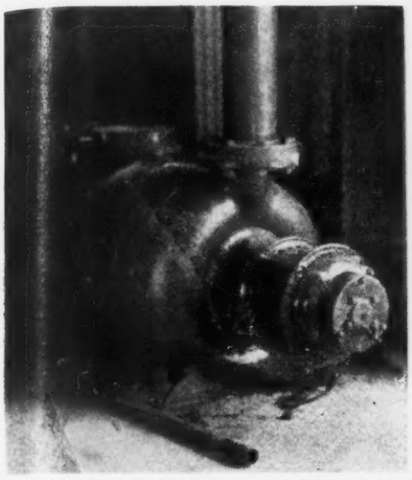
These "pebble" bins hold 400 tons and supply the feed to the Raymond mills below. There are two of these, one 4-roller and one 5-roller. The discharge is sent by a fan to the usual Raymond air separation system and the finished product is sent to the land plaster bins. A part of the land plaster goes to a separate building in which there are storage bins and a Bates valve bag packer, and this will be sold for fertilizer. The remainder goes to the bins above the calcining kettles.

The sale of land plaster for fertilizer is expected to be an important part of the company's business. The land in western Washington and the crops raised demand gypsum rather more than they do in some other parts of the country, and a survey has shown a large possible market for the product.

There are two kettles of standard Ehrsam design, with bottoms of heavy steel plate. Oil is used for fuel and each burner is provided with a meter so that the oil used in each may be known and recorded. Air for the burners is furnished by a direct-connected blower and 5½-h.p. motor, both made by the General Electric company. This set furnishes air at 21 lb. pressure.

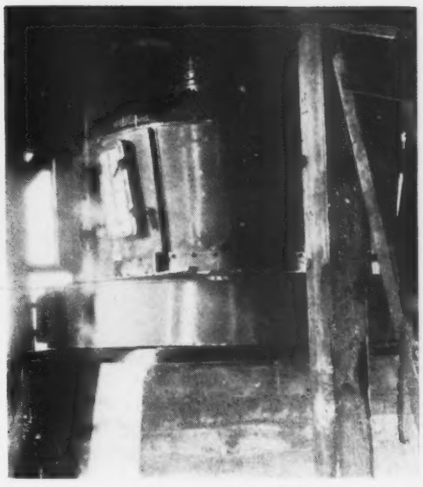


Plant of the Standard Gypsum Co. in Seattle. The dock is at the extreme left; then, in order, the storage shed, the plaster plant and the agricultural gypsum plant (at the extreme right)

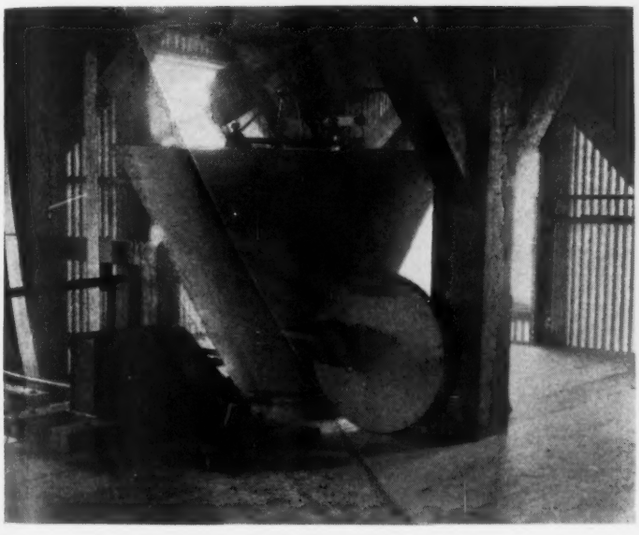


Electrically driven blower for oil fuel

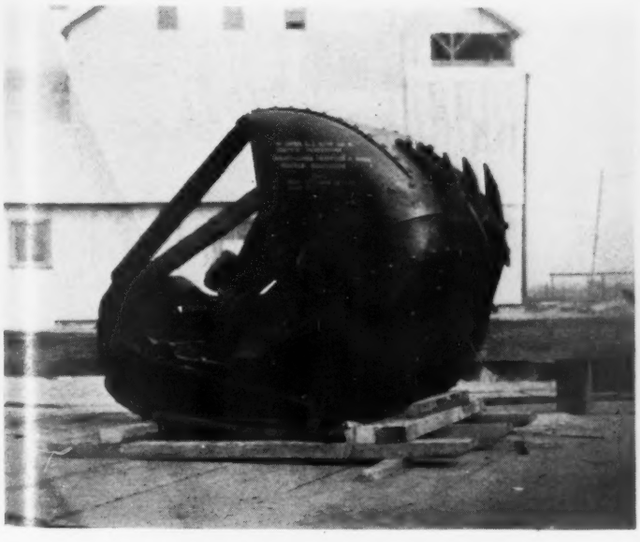
Front of one kettle showing oil pipes and meter. The oil is atomized by air from the blower

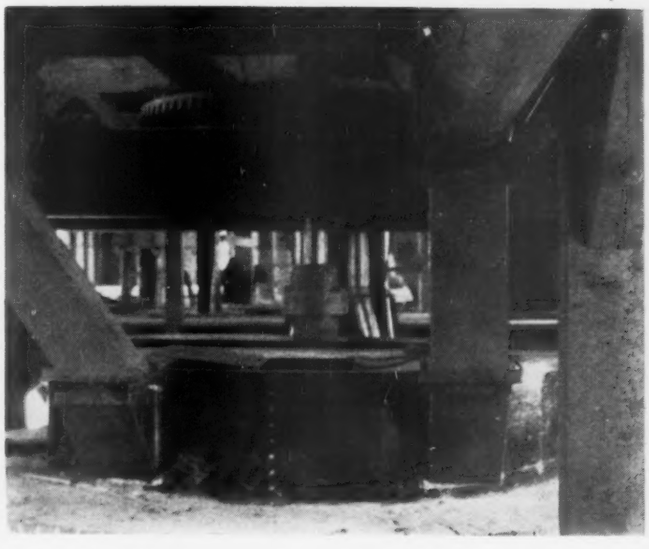


Type of mill used in grinding

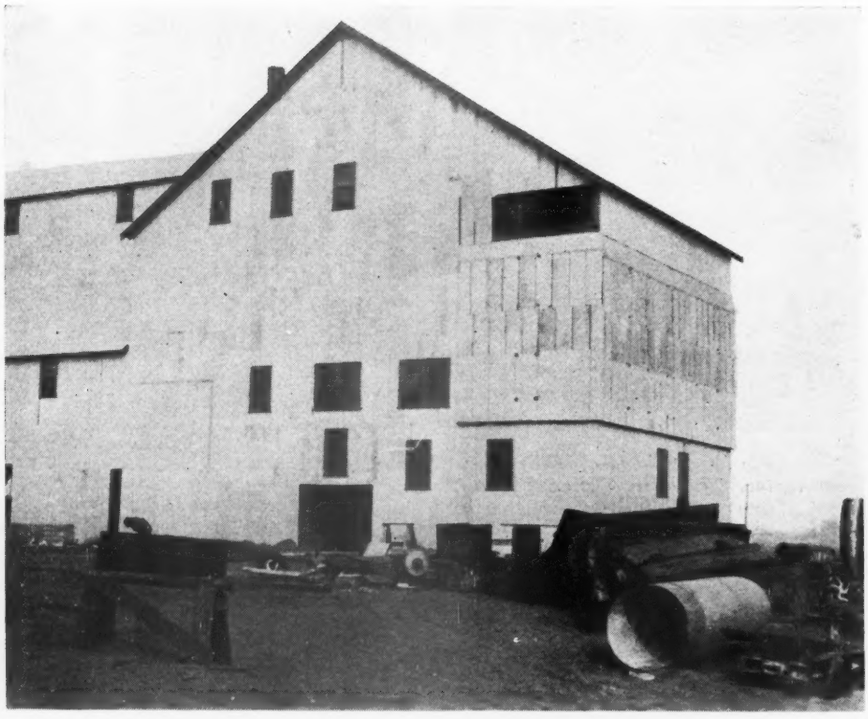


Left—Weighing cone in the plaster mill with hair picker and top of spill elevator. Right—Conveying system from hot pit to elevator





Left—Toothed bucket (3-yd.) used for unloading ships at the dock. Right—Top of kettle showing driving gear



The plaster mill. This, with the other photos on this page, was taken during construction

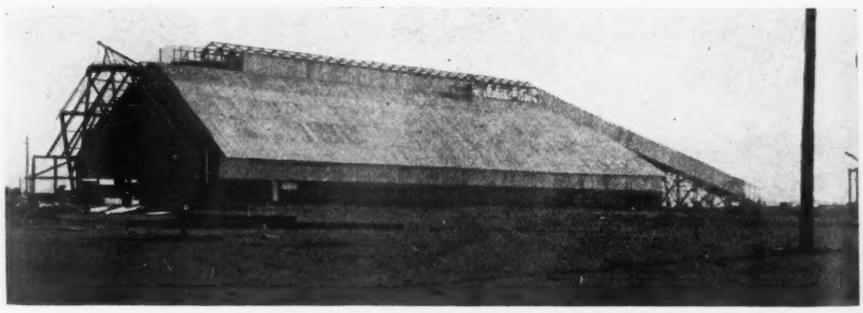
The calcined plaster falls into a hot pit through a chute that has a gate which is left opened while the kettle is being charged. This prevents any uncalcined material from getting into the hot pit. This was shown in the "Hints and Helps" section of Rock Products for June 27 as used in another plant.

The hot pit is of reinforced concrete and is 44 ft. long, 10 ft. wide and 9 ft. high, closed at the top. There are eight 8-in. screw conveyors across the bottom of the pit the short way and all these feed into a 12-in. screw conveyor that runs the long way, outside of the pit. Each short conveyor is driven through a clutch on a shaft so that any one may be stopped or started without interfering with the others. The discharge of the 12-in. conveyor goes to the boot of the hot elevator which takes it to the stucco bin. This elevator is 60 ft. high and it and the screw conveyors are encased in steel plates.

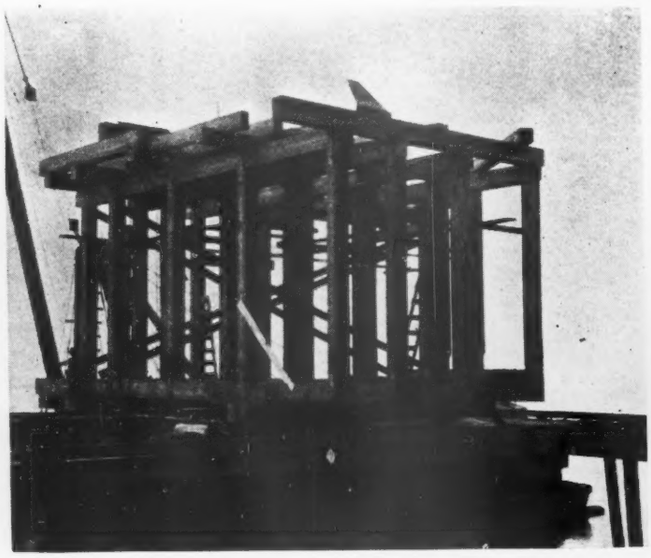
The stucco bin is about 60 ft. long and extends the length of the wing of the building in which plaster is mixed. There are two weighing hoppers beneath it and each has a hair picker set beside the hopper discharge. These feed into the mixer below. A "spill" elevator from the lower floor also discharges into the mixer. This takes care of any spills of mixed plaster which may happen on the floor below. The remainder of the space below the stucco bin is used as storage for hair, fibre and retarder. Hoppers and mixers are of Ehrsam make.

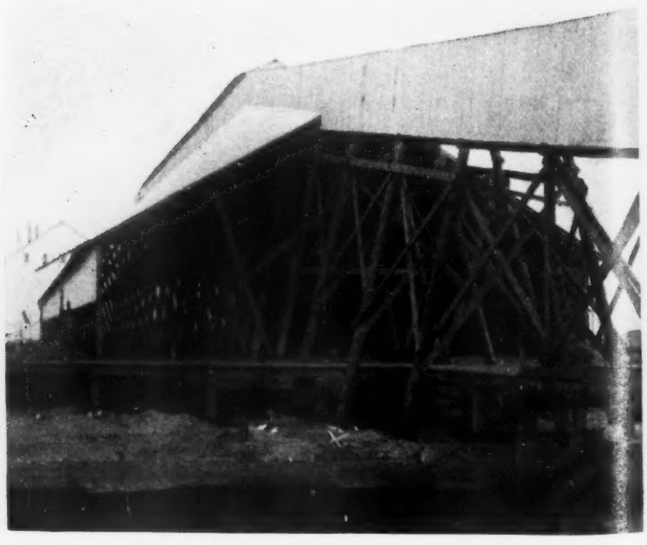
On the floor below are two Bates valve-bag packers and storage for finished plaster. The track for shipping runs along by this floor, between the plaster mill and the fertilizer building.

The buildings are all of heavy timber



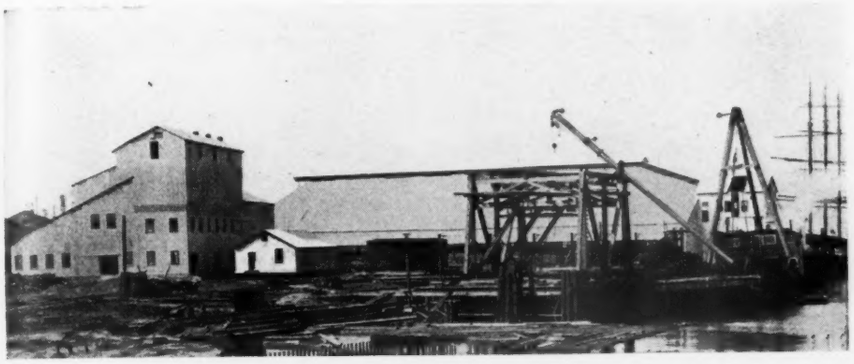
The storage house will contain 30,000 tons of gypsum rock





Left—Frame on which derrick will be mounted. Right—Conveyor gallery from dock and end of storage house showing substantial construction

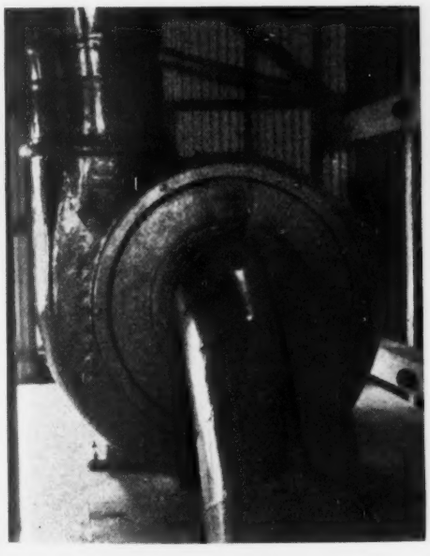
construction covered with galvanized steel. Even the big storage shed is made of timbers, 14-in. round sticks being used for the main supporting members. The use of timbers would be unusual on the Eastern coast but it is the regular thing in Seattle where heavy dimension timbers



Plant of the Standard Gypsum Co. at Long Beach, Calif.

may be had at this writing for $17 to $18 per M.

It will be noted that there is no regrinding of the stucco. Experiments with plaster made from the rock used in this plant have shown that there is so little difference in the prepared plaster with and without regrinding of the stucco that a regrinding department was not included.

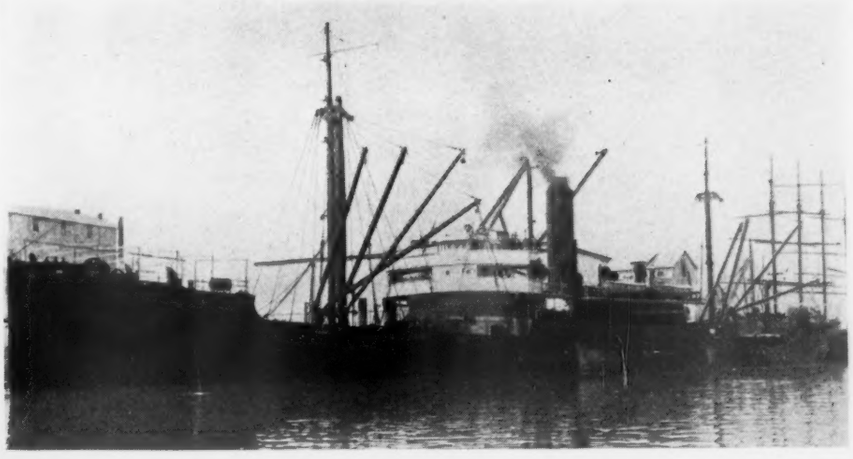


Fan used in connection with air separation

The omission of dryers and regrinding machines has considerably simplified the plant as compared with many plaster mills.

The Standard Gypsum Co. maintains an office in Seattle. Martin Uldall of San Francisco is president of the company. W. B. Gray is secretary and S. A. Perkins is chairman of the board of directors. W. C. Ridell is chief engineer. C. O. Bunker is superintendent in charge of the Seattle plant. W. S. Keith is Northwest manager.

The company has recently built a plaster mill at Long Beach, Calif., which resembles in many respects the Seattle plant. It receives its gypsum rock from the same Mexican deposit.



The "S. A. Perkins" (formerly the "Pallas"), one of the company's fleet of gypsum carrying steamships

The Alaska-Mexico Transportation Co. has put into service the 7600-ton steel steamship *Pallas*, which is to be christened the *"S. A. Perkins."* This shop will be used in exclusive service for the Standard Gypsum Co. The *Pallas* will not only carry cargo, but will tow two steel barges which hold 6500 and 4200 tons respectively.

The greater part of the voyage from San Marcos Island is through waters that are rarely visited by storms.

A description of the operations on San Marcos island was printed in the May 2, 1925, issue of Rock Products.

Minnesota To Furnish Cement for State Roads

WHETHER the state can reduce the cost of concrete paving next year by buying cement itself and furnishing it to the paving contractors is to be determined by a trial of the plan, according to an announcement by the Minnesota highday department.

"The department aims is to get maximum value for every auto and gas tax dollar entrusted to it," said Commissioner C. M. Babcock. "There are differences of opinions among highway officials of various states as to whether it is cheaper for the state to buy the cement going into highway pavements. However, Illinois is continuing the practice in the building of more than 1000 miles of new pavement every year under its $160,000,000 bond program and some other states have adopted it. It will be tried in Minnesota so that advantage may be taken of any savings that may result."

Bids will be called for late this year or early next year for the full quantity of cement that will be needed for 1926 trunk highway paving. No estimate has been made yet, but nearly 75 miles now being put under contract will take approximately $300,000 of the product in order to complete them.

California Portland To Build New Unit

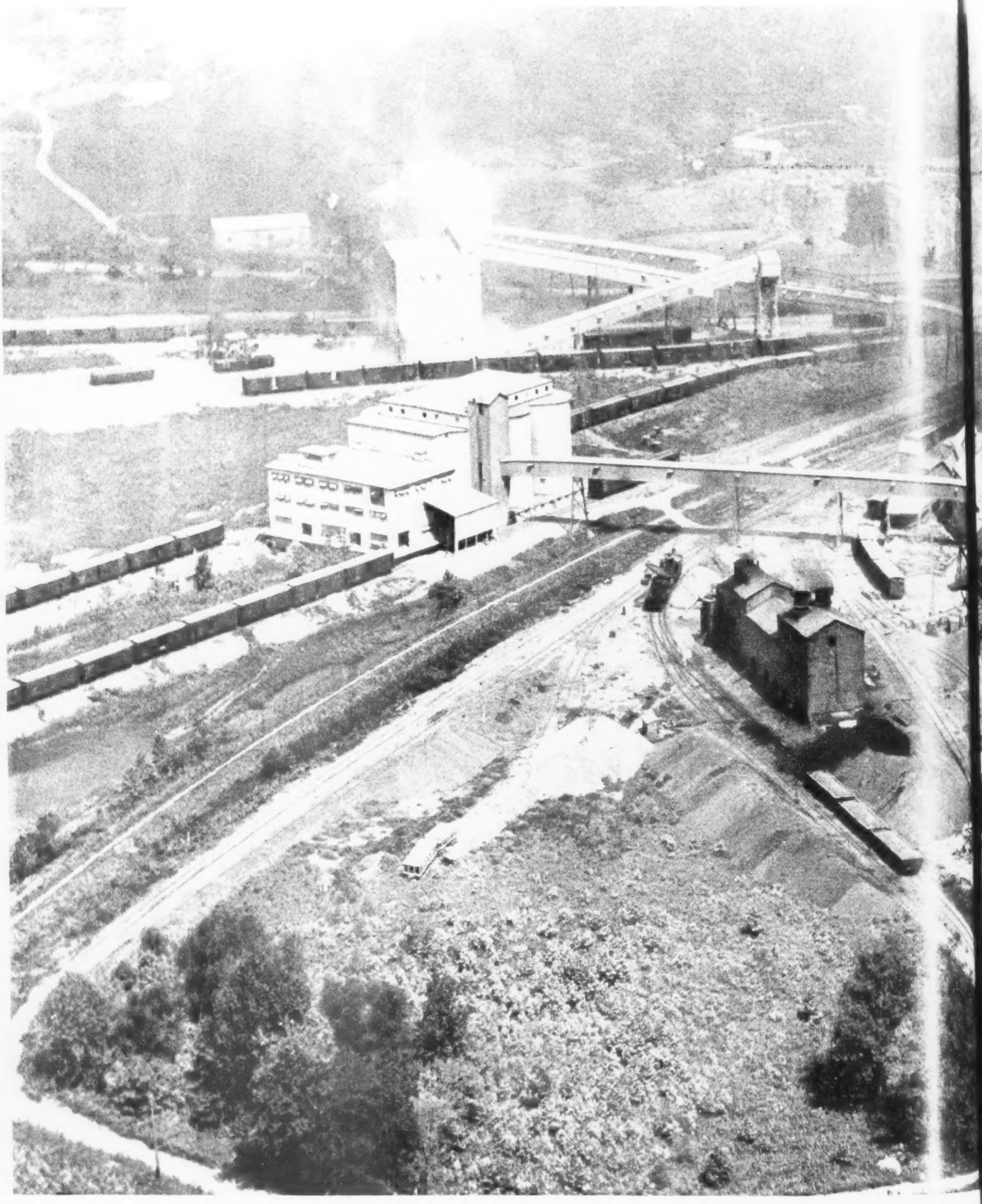
THE California Portland Cement Co., Los Angeles, Calif., has awarded to the Austin Co. of Chicago, the contract for the erection of a new unit to their Colton, Calif., plant.

The cement plant unit will be 500x62 ft., and will provide for a machine shop, covered storeroom, belt shop, carpenter shop, electric shop, boiler shop, blacksmith shop, hospital and offices.

Completed it will represent an investment of approximately $100,000, for building and equipment.

The building will be of steel and galvanized iron construction. A 10-ton crane runway 70 ft. wide will extend along the side of the building for a distance of 180 ft.

According to the terms of the contract, the work will be completed by the Austin Co. within the next four months.—*Los Angeles (Calif.) Times.*



Airplane view of Marquette Cement Co.'s plant at Cape Girardeau, Mo.; crusher and quarri in the at righ

the ... at right ... that of Edward Hely Stone Co. Photo by courtesy of Cape Girardeau (Mo.) Missourian

Patent Granted on Straight-Line Cement Plant

J. C. Buckbee, of J. C. Buckbee & Co., of Chicago, Patents Design by Which the Petoskey Portland Cement Co.'s Plant Was Built

AN unusual patent was recently granted to J. C. Buckbee, head of J. C. Buckbee and Co. of Chicago, the well known firm of engineers and designers of cement and other rock products plants. The patent covers the straight line production system as applied to cement plants which Mr. Buckbee used in designing the plant of the Petoskey Cement Co.'s plant at Petoskey, Mich.

As this patent is so interesting to the entire cement industry it is reprinted in full from the patent office copy, including the illustrations. The number of the patent is 1,561,213 and the date is Nov. 10, 1925.

To all whom it may concern:

Be it known that I, John C. Buckbee, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Straight-Line Cement Plants, of which the following is a specification.

The present invention relates to the manufacture of cement and more particularly has to do with the construction and arrangement of the plant and its equipment.

The main and primary object of the invention is to provide a plant wherein the highest economy of time, labor and expense may be effected in its construction, as well as its maintenance, and in which the operations in the treatment of the material from the raw states to the finished product may be accomplished with distinct savings in the cost of such operations.

Furthermore, the invention contemplates the provision of a plant of the character set forth in which the relation of the several units is such as to permit expansion or enlargement of the plant, as such may be required, without impairment of the original installation, and without the necessity of discontinuing the operation of the plant during the period in which such expansion or enlargement may take place.

A further object of the invention is to provide a plant of the character described in which the passage of the material, and the sequence of operations thereon, is in a direct line from the time that the material in its raw state enters the plant until it emerges therefrom in the finished product. This economizes in the area covered by the plant, so that undue waste in the space on which the plant is placed is overcome, and likewise minimizes the time for treatment of the material, thus enabling the finished product to be produced at less expense and with greater facility and ease than under the conditions hitherto existing in the manufacture of cement.

Having these general objects in view, and others which will appear as the nature of the improvements is better understood, the invention consists substantially in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and finally pointed out in the appended claim.

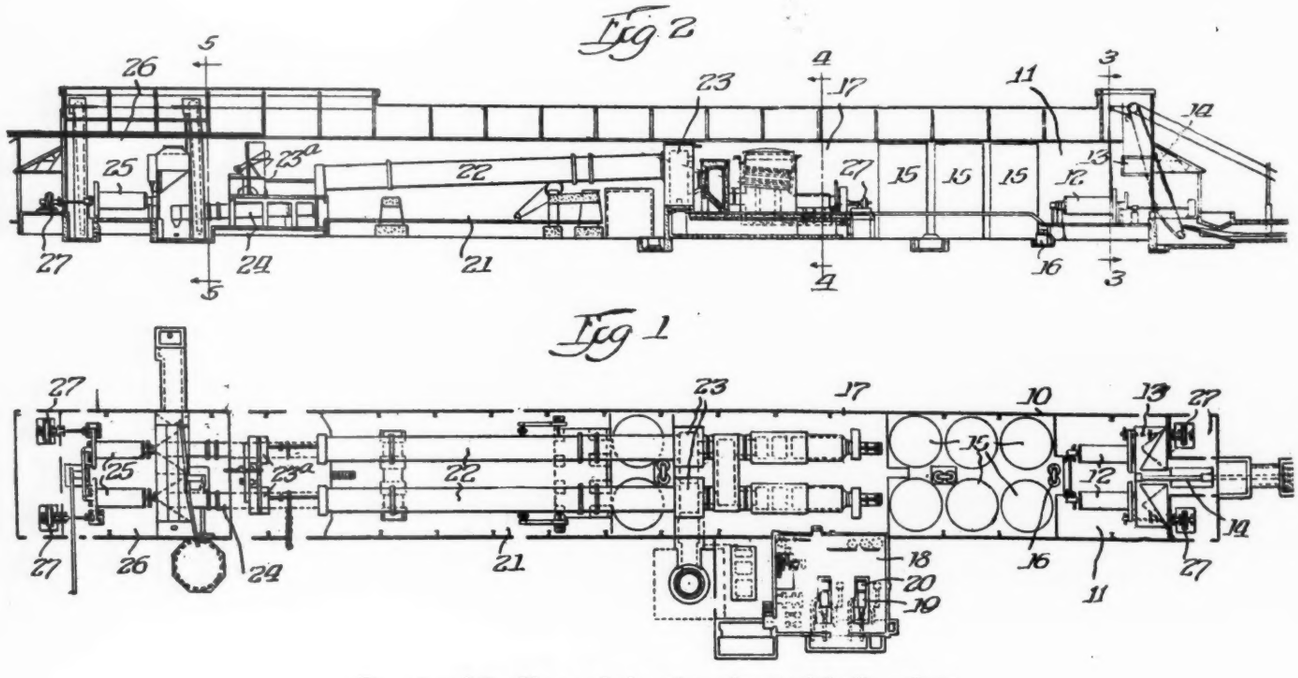
In the drawings—

Figure 1 is a section plan view of a straight-line cement plant constructed in accordance with the present invention.

Figure 2 is a central longitudinal sectional view thereof.

Figures 3, 4, and 5, are transverse sectional views on the line 3—3, 4—4 and 5—5, respectively of Figure 2.

As before premised, it is the object of the present invention to provide a straight-line cement plant in which the passage of the material, and the sequence of operations thereon, is in a direct line from the time that the material in its raw state enters the plant until it emerges therefrom in the finished product. To this end the invention contemplates a plant of this character all of the departments of which are housed under a single roof and which are in line with each other so that as the material passes from one department to the other it will follow a direct path, and thereby avoid the necessity for utilizing transfer devices and apparatus for transportation of the material to the separated points in which the various departments



Figs. 1 and 2—Plan and elevation of a straight line plant

heretofore have been located. Having these features in mind, the numeral 10 designates the housing of the plant. This may be a building of any desired construction in accordance with modern engineering practice, and it may be formed of any desired material. By reason of the utilization of the present invention, the structure 10 need be of only relatively low height and only sufficient to accommodate the apparatus and equipment disposed therein. Likewise, by the utilization of the invention the width of the structure 10 may be relatively narrow, and because of its construction to accommodate disposition of the various units in a direct line, the structure is devoid of pronounced angular projections, thus adapting the same for the construction of extensions laterally thereof if it be found desirable to increase the size of the plant and the equipment therein.

The raw mill department 11 occupies one end of the housing 10. Within said department are included the usual mills 12, raw bins 13 and elevator 14 for transferring the raw material from an external storage point to the bins 13. In line with the equipment of the raw mill department just described are the slurry tanks 15 into which the material is passed by pumps 16 or the like. Next in line with the raw mill department is the boiler department 17 of the power plant, and here are located boilers which utilize the waste heat from the kilns through which the material is passed as it advances through the plant. At one side of the boiler department 17, and forming part of the same, is a power station 18 in which are located electrical generators 19 operated by turbines 20 which derive their power from the boilers of the department 17. This power station affords the necessary energy for the electric motors, hereinafter referred to, by which the several units are driven.

In line with the boiler department 17 is the kiln room 21, the kilns 22 of which are connected with flues 23 by means of which the waste gases pass from the kilns to the waste heat boilers in the department 17, where said gases are utilized in the firing of these boilers. The opposite ends of the kilns 22 are in line with the powdered coal firing apparatus 23a by means of which the kilns are heated, the kilns discharging into cooling apparatus 24 from which the material finally passes to the grinding mills 25 of the finishing department 26 the finished material may be passed by suitable conveyors to a stock house or other point of storage.

Fig. 3.

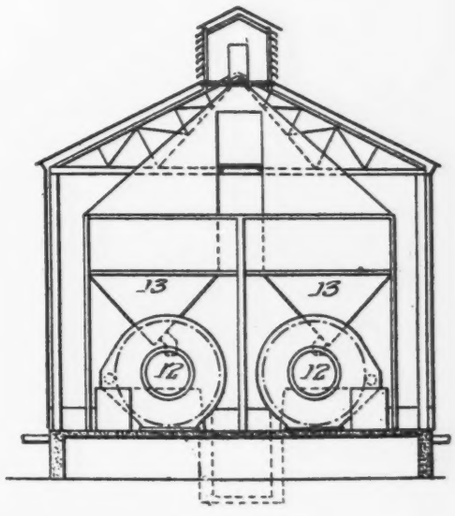
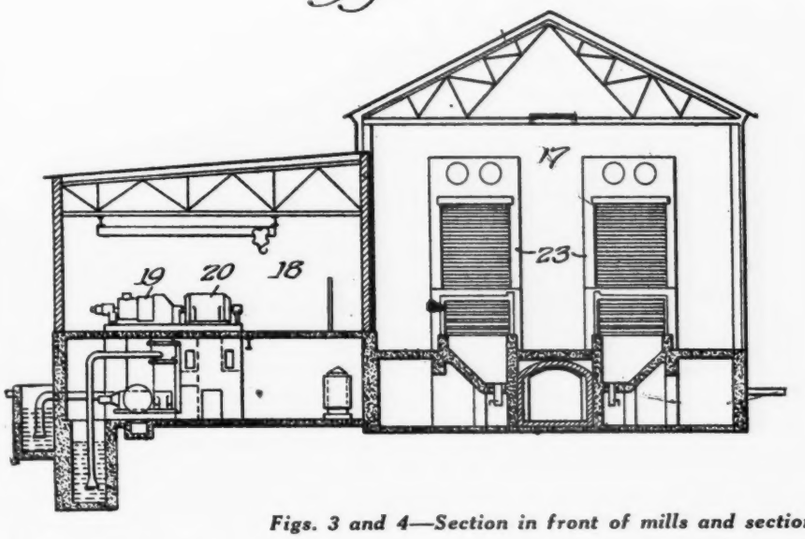


Fig. 4.



Figs. 3 and 4—Section in front of mills and section through power house

Fig. 5

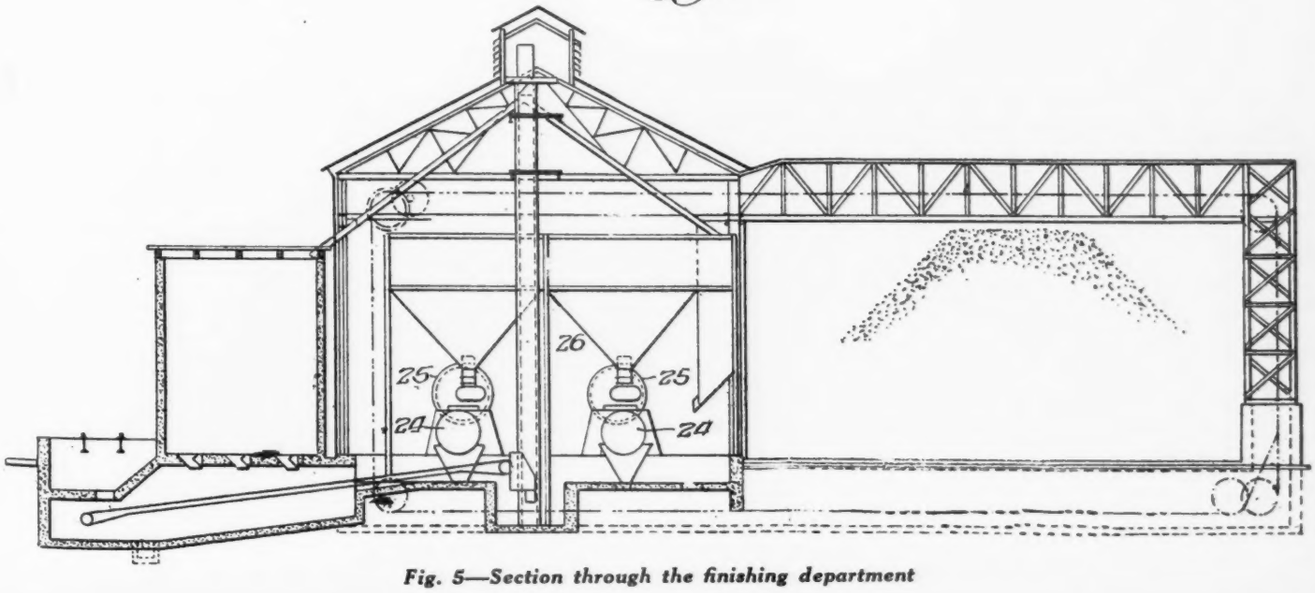


Fig. 5—Section through the finishing department

From the foregoing description it is evident that the arrangement and construction herein delineated affords a straight-line cement plant wherein the material, once it is introduced in the raw state, passes in a direct line from the point of its first treatment, through its intermediate stages of treatment, and to the point of final finishing, so that the apparatus utilized in such treatment is arranged in a direct line, the various departments receiving the material directly from the preceding departments, and without any deviation of the material from such direct path so long as it traverses the several departments in which the same is subjected to treatment.

Various electrical driving units 27 are employed for the operation of the different units, thus affording independent driving of these units, with utilization of power derived from the station 18. The power plant thus is centralized, and the power distributed in a highly advantageous and economical manner, and the compact arrangement of the several treating departments enables the operation and maintenance of the entire plant with maximum economy of time, labor and expense.

While the plant herein illustrated is of the wet type, it will be understood that the invention is equally adaptable to dry plants. In such event the slurry tanks 15 are replaced by bins for the raw material in a dry state.

I claim:

A straight-line cement plant of the class described, comprising a raw mill department, a power station, a kiln department, and a finishing department sequentially arranged and in a direct line with each other, whereby the material introduced in its raw state passes from the raw mill to the finishing department in a direct line.

In witness whereof I have hereunto set my hand.

JOHN C. BUCKBEE.

Indiana Sand and Gravel Association Re-elects Guy Sutton President

Annual Meeting at Indianapolis, December 9 and 10

THE Indiana Sand and Gravel Association, at its annual meeting at Indianapolis, December 9 and 10, re-elected E. Guy Sutton, secretary-treasurer of the Neal Gravel Co., Mattoon, Ill., president; Lee R. Witty, general manager of the Wabash Sand and Gravel Co., Terre Haute, Ind., vice-president, and Jesse A. Shearer, president of the Indiana Gravel Co., Indianapolis, treasurer.

President Sutton made a splendid address on the problems faced by the industry in Indiana, where political wire-pulling, apparently, is a prime essential of business getting. The association under the able management of S. C. Haddon has endeavored to meet the situation more on engineering and scientific ground than by political backfiring, although even this has been resorted to. All expressed regret that politics could not be separated from road building, and materials, business, and individuals stand on their own merits.

E. Guy Sutton, president

A new and enlarged program of activities was adopted for the coming year. These include a continuation of tests at Purdue University, which have been productive of some very interesting and valuable results. They show, among other things, that some of the strongest concrete is made of fine gravel—from ½ in. down. (These results have been verified and put into actual practice by the Lyman-Richey Sand and Gravel Co. in Nebraska, as described in the first article of this issue.) It is also proposed to do some adver-advertising in 1926.

Lee R. Witty, vice-president

Jesse A. Shearer, treasurer

Among the speakers at the meeting were Earl Crawford, member of the Indiana State Highway Commission, whose subject was "Indiana Highway Paving Program for 1926"; William Parrott, county engineer, Vermillion county, who spoke on "County Road Building as Viewed by a County Engineer," and A. H. Hinkle, superintendent of maintenance, Indiana State Highway Commission, whose subject was "Indiana State Highway Maintenance Problems and Program."

Indications at this meeting were that 1925 would be the biggest year in point of production the Indiana producers have ever experienced, exceeding by a small margin the 1923 production, which was the largest of any year before or since. All look for next year to be at least as good as 1925.

Everybody congratulated "Sam" Haddon, the new executive secretary, on the splendid work he has done since he took over the office in April of this year. He is a civil engineer, a graduate of the University of Illinois, thoroughly experienced in journalistic and promotional work, and a fighter whose tactics are scientifically and logically based.

The members of the Indiana association feel that they are still the pioneer and leading association of sand and gravel producers and that they are meeting the problems of promotion as well or better than they are being met by any association in the mineral aggregate industry.

Sand-Lime Brick Industry About Toronto

TORONTO is the center of the Canadian sand-lime brick industry. The plants now located in Toronto include the Toronto Brick Co. at Swansea and Toronto and they also have their own lime quarry; York Sandstone Brick Co. at East Toronto; Caledon Brick Co., Harbor Brick Co., Canada Sand Lime Brick Co., Wilcox Lake Brick Co. at North Toronto, and Hynes Brick Co. The Leaside Brick and Sand Co. has almost completed the erection of a two-unit plant.

The first sand lime brick plant at Toronto was built by Robert Kennedy in 1905 and is still operating under the name of the Canada Sand Lime Brick Co., Ltd.

During the past year Hynes Bros. and the Harbor Brick Co. installed new machinery, while the Don Valley Brick Co. also has a two-unit plant which it operates in connection with a clay brick plant.

The production of sand lime brick in Ontario has shown a steady growth. In 1920 there were 27,703,000 sand lime brick produced; 1922, 48,924,000, and 1923, 61,772,000. In 1924 there was a price war and production fell to 55,371,000. This year will show a good increase as the production for the first six months was about 33,000,000.

The Toronto plants have a daily capacity of about 300,000. The York Sandstone Brick Co., formed in 1912, is one of the largest in the Dominion. During the first seven months of this year the company produced 13,250,000, while for the whole of last year the production was only 12,000,000. T. J. Smyth is managing director and W. A. Smyth is secretary-treasurer.

In Alberta there is one sand-lime brick plant, two in Saskatchewan, and two in Manitoba. Frank E. Waterman, manager, Toronto Brick Co., Ltd., is vice-president of the Sand Lime Brick Association.

Montreal—Convention City

Over 200 Room Reservations Made Before December 1

SECRETARY J. R. Boyd, of the National Crushed Stone Association, was in Montreal, Que., December 2 and 3 making final arrangements for the convention at the Mount Royal Hotel, January 18, 19, 20, and 21. More than 200 room reservations had been made prior to December 1, which certainly is evidence enough that the convention attendance is going to break all records.

The hotel is admirably adapted to take care of the convention; it is not going to be a particularly busy week. President Graves, of the Association, insisted on having the whole hotel for the convention.

Great preparations are being made for entertainment. An ice-hockey game, skiing, and tobogganing will be in order. Clothes and everything necessary to enjoy these sports are provided for visitors.

The program is rapidly taking shape and will prove of more than ordinary interest to operating men. Booths for the exhibit are in great demand. New members are joining.

Mount Royal Hotel, Montreal, Que., where National Crushed Stone Association will meet January 18, 19, 20, 21

Ball-room where the meetings will be held

Financial News and Comment

Rhodes-Jamieson Bond Offering

BRADFORD, KIMBALL AND CO. and Wm. Cavalier and Co., San Francisco, are offering at prices to yield from 6% to 7%, according to maturity, $500,000 first (closed) mortgage 7% serial gold bonds of the Rhodes-Jamieson Co., Oakland, Calif.

Dated September 1, 1925; due serially September 1, 1926 to 1937 inclusive. Callable, all or part, last maturity first, on any interest date upon 30 days' notice at 102½ and interest. Denominations, $1000 and $500. Interest payable M. & S. without deduction of normal federal income tax up to 2% at American bank, San Francisco, trustee. Exempt from personal property tax in California.

Data from letter of President G. G. Jamieson, Oakland, Calif., November 5:

History—In 1904 A. G. Rhodes and G. G. Jamieson entered into a co-partnership, each paying in $3000, and began the handling of fuel and building materials. The first plant was located at 1520 Park street., Alameda. Operations were on a modest scale until the

(Continued on page 60)

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

(These are the most recent quotations available at this printing. Revisions, corrections and supplemental information will be welcomed by the editor.)

Stock	Date	Par	Price bid	Price asked	Dividend rate
Alpha Portland Cement Co. (common)**	Dec. 8	100	108	112	1¾% quar. 25% ex. Dec. 1
Alpha Portland Cement Co. (preferred)**	Dec. 8	100	109	.....	1½% quar. Sept. 1
Arundel Corporation (sand and gravel—new stock)	Dec. 9	No par	37	37¾	30c quar. Oct. 1
Atlas Portland Cement Co. (common)	Dec. 7	No par	53⅝	55	50c quar.
Atlas Portland Cement Co. (preferred)	.....	100	.....	.....	2% quar. Oct. 1
Atlas Portland Cement Co. (preferred)**	Dec. 8	33⅓	45	.....	2% quar. Oct. 1
Bessemer Limestone and Cement Co. (common)‡	Dec. 5	100	140	145	1½% quar. Jan. 1, 4% ex. Jan. 1
Bessemer Limestone and Cement Co. (preferred)‡	Dec. 5	100	106½	107½	1¾% quar. Jan. 1
Bessemer Limestone and Cement Co. (convertible 8% notes)‡	Dec. 5	.....	115	125	8% annual
Boston Sand and Gravel Co. (common) (r)	Dec. 4	100	64	65½	2% quar. July 1
Boston Sand and Gravel Co. (preferred) (d)	Dec. 4	.....	.....	80	1¾% quar. Oct. 1
Boston Sand and Gravel Co. (1st preferred) (d)	Dec. 4	.....	.....	90	2% quar. Oct. 1
Canada Cement Co., Ltd. (common)	Dec. 9	100	102¾	103	1½% quar. Oct. 16
Canada Cement Co., Ltd. (preferred) (f)	Dec. 4	100	115	.....	1¾% quar. Nov. 16
Canada Cement Co., Ltd. (1st 6's, 1929) (f)	Dec. 4	.....	102¼	103	3% semi-annual A&O
Canada Crushed Stone Corp., Ltd. (6½s, 1944) (f)	Dec. 4	100	96	99	
Charles Warner Co. (lime, crushed stone, sand and gravel)	Dec. 7	No par	22	25	50c quar. Oct. 10
Charles Warner Co. (preferred)	Dec. 7	100	98	102	1¾% quar. Oct. 22
Charles Warner Co. (lime, crushed stone, sand and gravel) 7s, 1929 (r)	Dec. 4	100	104¾	.....	
Cleveland Stone Co.	Dec. 9	.....	130	135	1½% quar., 1% ex. Dec. 1
Connecticut Quarries Co. (1st Mortgage 7% bonds) (s)	Dec. 4	100	102½	.....	
Dolese and Shepard Co. (crushed stone) (a)	Dec. 9	50	58	.....	1½% quar.
Edison Portland Cement Co. (common)	Nov. 3	50	7½c(x)	.....	
Edison Portland Cement Co. (preferred)	Nov. 3	50	17½c(x)	.....	
Giant Portland Cement Co. (common)**	Dec. 8	50	37	40	
Giant Portland Cement Co. (preferred)**	Dec. 8	50	48	52	3½% s.-a. Dec. 15, plus 10% arrears
Ideal Cement Co. (common)‖	Dec. 7	No par	79	82	$1 quar. June 30
Ideal Cement Co. (preferred)‖	Dec. 7	100	106	108	1¾% quar. June 30
International Cement Corporation (common)	Dec. 9	No par	71⅛	71¾	$1 quar. Dec. 31
International Cement Corporation (preferred)**	Dec. 9	100	104½	104½	1¾% quar. Dec. 31
International Portland Cement Co., Ltd. (preferred)	Mar. 1	.....	30	45	
Kelley Island Lime and Transport Co.	Dec. 9	100	120⅛	124	2% quar. Oct. 1
Lawrence Portland Cement Co.**	Dec. 8	100	110	.....	2% quar.
Lehigh Portland Cement Co.‖	Dec. 7	50	88	91	1½% quar.
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, expire serially up to 1930) (k)	Dec. 4	100	99½	100½	
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, expire serially from 1930 to 1935) (k)	Dec. 4	100	97	99	
Michigan Limestone and Chemical Co. (common)‖	Dec. 7	.....	23	.....	
Michigan Limestone and Chemical Co. (preferred)‖	Dec. 7	.....	23	.....	1¾% quar. July 15
Missouri Portland Cement Co.	Dec. 9	25	65½	65½	50c quar.; 25c ex. Dec. 18
Missouri Portland Cement Co. (serial bonds)	May 29	.....	104½	104½	3¼% semi-annual
Monolith Portland Cement Co. (common) (c)	Nov. 20	.....	8¾	9¼	
Monolith Portland Cement Co. (units) (c)	Nov. 20	.....	24¼	25¾	
Monolith Portland Cement Co. (preferred) (c)	Nov. 20	.....	7¾	8¼	
Newaygo Portland Cement Co.*	Dec. 5	.....	120	.....	
New England Lime Co. (Series A, preferred) (i)	Dec. 4	100	96½	99	
New England Lime Co. (Series B, preferred) (i)	Dec. 4	100	96½	99	
New England Lime Co. (V.T.C.) (i)	Dec. 4	.....	23	25	
New England Lime Co. (6s, 1935) (m)	Dec. 5	100	97½	100	
North American Cement Corp. 6½s 1940 (with warrants)	Dec. 9	.....	100	100	
North American Cement Corp. (units of 1 sh. pfd. plus ½ sh. common) (z)	Nov. 13	.....	94	99	2 mo. period at rate of 7%
Olympic Portland Cement Co. (g)	Oct. 13	.....	.....	£1⅝	
Pacific Portland Cement Co., Consolidated (§)	Dec. 5	100	86⅞	87	
Pacific Portland Cement Co., Consolidated (secured serial gold notes)§	Dec. 5	.....	99½	100	3% semi-annual Oct. 15
Peerless Portland Cement Co.*	Dec. 5	10	6	6¾	
Petoskey Portland Cement Co.*	Dec. 5	10	9	10	1½% quar.
Phosphate Mining Co. (1)	Nov. 25	.....	1@5	.....	
Pittsfield Lime and Stone Co. (preferred)	.....	100	.....	.....	2% quar. Apr. 1
Rockland and Rockport Lime Corp. (1st preferred) (d)	Dec. 4	100	.....	98	3½% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (2nd preferred) (d)	Dec. 4	100	.....	70	3% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (common) (d)	Dec. 4	No par	.....	70	1½% quar. Nov. 2
Sandusky Cement Co. (common)*	Dec. 9	100	107	112	2% quar. July 1
Santa Cruz Portland Cement Co. (bonds) (§)	Dec. 5	.....	105	106	6% annual
Santa Cruz Portland Cement Co. (common) (§)	Dec. 5	50	84	.....	$1 April 1
Superior Portland Cement Co.	Mar. 1	100	.....	120	
Tidewater Portland Cement Co. (common) (3)	Nov. 25	.....	8½	.....	
United States Gypsum Co. (common)	Dec. 10	20	157	159	2% quar. Dec. 31, $2 plus 15% stock ex. Dec. 31
United States Gypsum Co. (preferred)	Dec. 9	100	117½	118	1¾% quar. Dec. 31
Universal Gypsum Co. (common)†	Dec. 9	No par	21½	23	
Universal Gypsum V. T. C.†	Dec. 9	No par	19½	21	
Universal Gypsum Co. (preferred)†	Aug. 5	.....	76	.....	1¾% quar. Sept. 15
Universal Gypsum Co. (1st mortgage 7% bonds)†	Dec. 9	.....	99	(at 6½%)	
Union Rock Co. (7% serial gold bonds) (y)	Nov. 3	100	99	101	
Vermont Milling Products Co. (slate granules) 50 sh. common and 100 sh. pfd. (2)	Nov. 3	.....	$1 for the lot	.....	
Wabash Portland Cement Co.*	Aug. 3	50	60	100	
Wisconsin Lime and Cement Co. (1st Mort. 6s, 1940) (o)	Nov. 9	100	98½	100	
Wolverine Portland Cement Co.	Dec. 8	10	6½	6½	2% quar. Aug. 15

*Quotations by Watling, Lerchen & Co., Detroit, Mich. **Quotations by Bristol & Bauer, New York. †Quotations by True, Webber & Co., Chicago. ‡Quotations by Butler, Beadling & Co., Youngstown, Ohio. §Quotation by Freeman, Smith & Camp Co., San Francisco, Calif. ‖Quotations by Frederic H. Hatch & Co., New York. (a) Quotations by F. M. Zeiler & Co., Chicago, Ill. (b) Quotations by De Fremery & Co., San Francisco, Calif. (c) Quotations by A. E. White Co., San Francisco, Calif. (d) Quotations by Lee, Higginson & Co., Boston, Mass. (f) Nesbitt, Thomson & Co., Montreal, Canada. (g) Neidecker and Co., Ltd., London, England. (i) E. B. Merritt & Co., Inc., Bridgeport, Conn. (k) Peters Trust Co., Omaha, Neb. (m) Second Ward Securities Co., Milwaukee, Wis. (o) Central Trust Co. of Illinois, Chicago, Ill. (r) J. S. Wilson Jr. Co., Baltimore, Md. (s) Chas. W. Scranton & Co., New Haven, Conn. (x) Price obtained at auction by Barnes and Lofland, Philadelphia, on Nov. 3, 1925. (y) Dean, Witter & Co., Los Angeles, Calif. (z) Hemphill, Noyes & Co., New York. (1) Price obtained at auction by Adrian H. Muller & Sons, New York. (2) Price obtained at auction by Wise, Hobbs and Arnold, Boston, Mass. (3) Price obtained at auction by Weilepp-Bruton & Co., Baltimore, Md.

Editorial Comment

Depreciation and State Cement Plants

South Dakota papers carry a report on the state cement plant issued by the governor and backed up by comments from the state secretary and treasurer. This report shows that the state cement plant did not really lose money as previous and unofficial reports had stated. According to the governor's report there was actually a profit of $625.92.

Analysis of the reports shows that the difference lies in figuring depreciation and not including interest on certain state appropriations as a charge. Regarding the interest charge the reasons for refusing to allow it are not clear, but it may be assumed that they are sufficient to satisfy the governor and the treasurer. Regarding the proper amount to be set aside for depreciation, anyone has a right to inquire, for this is a matter that affects the whole cement industry. Costs which are figured with too low a depreciation rate are manifestly unfair to the industry when they are used as a basis for price making.

The rate taken by the official report quoted is approximately 4%, which is a very low depreciation rate for any rock products industry. Concerning the proper rate to allow for depreciation. C. N. Lindahl, chief accountant of the Universal Portland Cement Co. says:

(a) The cement business is one of continuous operation, 24 hours a day and 365 days in the year.

(b) Machinery is of an unusually heavy type with large electrical units requiring a heavy investment.

(c) Heavy gritty materials pass through this machinery, causing it to wear out rapidly.

(d) Resolves itself into the fact that the cement business is one requiring a *heavy rate for depreciation* to offset this wear and tear by continuous operation on high-priced equipment, by material that wears it out rapidly. This fact is usually overlooked. (Rock Products, March 21, 1925.)

And Mr. Lindahl might have added further that in these days of change the danger of obsolescence has also to be considered and accounted for.

The governor and other officers of the state have a right to their opinion as to the percentage of cost to be set aside for depreciation. But if too low an amount is used as a basis for figuring costs and prices merely to have the record of the plant show up well to the voters of the state, fair-minded persons have a right to protest.

Incidentally, the whole controversy shows how easy it is to juggle depreciation and obsolescence figures to show or not to show a profit, when we are dealing with an investment of $2,000,000 or more. The portland cement company or other rock products enterprise which pays dividends from funds that properly belong to a reserve against the inevitable day when the plant must be scrapped or rebuilt is headed for distaster should it meet a tight money market when replacements are most urgent.

The President's Message

The President in his recently published message to Congress said little in regard to federal aid for roads, but that little is enough, from the knowledge the country has of the President, to assure everyone that there is no intention of altering the federal aid policy, inasmuch as he mentions it as a part of the program which has become identified with his adminisrtation. The paragraph reads:

"The work for good roads, better land and water transportation, increased support for agricultural education, extension of credit facilities through the farm loan boards and the intermediate credit banks, the encouragement of orderly marketing and a repression of wasteful speculation, will all be continued."

Of perhaps equal interest to Rock Products readers is his flat rejection of the idea that the government can successfully operate industrial enterprises. He brings this out in the paragraph of his message which deals with Muscle Shoals, and which is quoted in full:

"If anything were needed to demonstrate the almost utter incapacity of the national government to deal directly with an industrial and commercial problem, it has been provided by our experience with this property. We have expended vast fortunes, we have taxed everybody, but we are unable to secure results which benefit anybody. This property ought to be transferred to private management under conditions which will dedicate it to the public purpose for which it was conceived."

One need not feel that he has been gifted with unusual prophetic insight to imagine a governor of one of the states that is operating a state enterprise in the rock products field expressing himself in much the same words within the next four or five years, provided he is equally frank in dealing with his constituents.

Opposition to Rate Increase

The resolutions passed by the Pacific Coast Sand and Gravel Association opposing the proposed increase in rates on sand, gravel, and stone, which were published recently, appear to be dictated by something beyond the natural desire to see the freight rates on one's product kept as low as possible. The ruling of the Interstate Commerce Commission at San Francisco that they would not hear testimony on intrastate movement removes most of the membership from the immediate effect of the proposed increase, and much of the production of the Pacific Coast is shipped by other means of transportation than by railroads. It is probable that the members of the association voted for the resolution because they felt that a flat increase, regardless of the length of haul, was highly discriminatory, and also that the sand, gravel, and stone industries are already paying their full share of the money received by the railroads for freight. This seems to be the opinion of producers throughout the country, so far as they have expressed themselves.

(Continued from page 58)

year following the San Francisco fire, when both the volume of business and the invested capital were doubled. Expansion began in 1908 with the purchase of a plant on the canal at the foot of Park street, Alameda, where both rail and water facilities are available. The next forward step occurred on April 20, 1911, with the organization of the Oakland Sand and Gravel Co. Shortly thereafter they purchased a controlling interest in the Pacific Fuel Co. Five years later all plants and properties were consolidated under one ownership with the formation of Rhodes-Jamieson and Co. In 1919 business of Swift and Wilcox, Berkeley, was purchased. The need of additional facilities prompted the purchase of the Renas warehouse at San Pablo avenue, in Berkeley. In addition company owns a plant on the Alameda Estuary, west of the Park street bridge and a small distributing yard at 5340 Grove street, Oakland.

At present time operations are almost entirely in the sale and distribution of building materials such as sand, gravel, lime, roofing material, ready mixed mortar, crushed rock, metal lath and the like.

NET SALES AND EARNINGS YEARS ENDED APRIL 30

	Net sales	Net profit*
1921	$1,101,135	$118,787
1922	1,267,780	128,949
1923	1,841,578	174,926
1924	2,366,603	238,996
1925	2,408,807	216,356

*Net profit from all sources before deducting depreciation.

Purpose—Proceeds will be used in connection with the development of the Eliot plant and to provide additional capital.

BALANCE SHEET AS OF SEPTEMBER 16, 1925 (After This Financing)

Assets	
Property	$1,243,000
Invest. corporate stocks	17,300
Cash	137,548
Accounts and notes receivable	525,146
Inventories	177,670
Other assets	55,966
Good-will	1
Total	$2,157,101
Liabilities	
7% preferred stock	$240,201
Common stock	1,000,000
First mortgage 7% serial gold bonds	500,000
Accounts payable	342,656
Notes payable	74,244
Total	$2,157,101

Superior Portland Plans Extensive Refinancing

WE are officially informed that negotiations for the sale of the Superior Portland Cement Co. of Seattle, Wash., one of the largest cement manufacturing concerns on the Pacific coast, to a new corporation are now in the process of formation. The firm of Bond, Goodwin and Tucker, one of the leading banking houses of the coast, are in charge of the financial proceedings. The sum involved is said to be between $5,000,000 and $6,000,000, making the deal one of the largest Northwest financial operations in recent years.

Details of the plan of financing the new corporation were withheld by the banking house pending the time when an option on the properties, given a month ago by stockholders of the owning corporation, should be exercised by the new firm. Consummation of the deal, however, is virtually certain, it was announced, and probably will be carried out within a short time.

John C. Eden, organizer and for 17 years president of the Superior Portland Cement Co., will head the new corporation.

Control of the new company is expected to remain in the Northwest, the banking firm announced. Many stockholders of the present owning company are residents of this section and a large number have signified their desire to purchase stock in the new concern. The securities generally, however, will be distributed broadly.

The plan of capitalization under the new corporation will consist of preferred and common stock, it was announced. No bonds or mortgages on the company's properties will be outstanding when the deal is consummated.

The negotiations were opened after Bond, Goodwin and Tucker had received extensive report on the properties and financial position of the Superior Portland Cement Co. from engineers and auditors brought here from New York City to make an examination. On their report an option on the property was given and plans for the organization of the new corporation set under way.

The Superior Portland Cement Co. was organized in 1907, and through the reinvestment of earnings during the last 17 years has grown to its present size, with a six-kiln plant having a capacity of 5000 bbl. daily. Distribution is general throughout Washington. Its sales in 1925, under an estimate made recently, will amount to approximately $3,144,000.

The company's plants are at Concrete, where the company owns extensive deposits of limerock. The company virtually has built its own town in the vicinity of the plant and supplies more than 60% of the power used at the plant from its own hydro-electric generating plant.

According to a report made by the banking firm, the company has shown a net profit each year of its existence and for the last 10 years has paid a monthly dividend without interruption.

Canada Cement Expected to Present Good Statement

IT is understood that the current fiscal year of the Canada Cement Co., Ltd., has proven quite satisfactory and that the showing will be of a nature entirely encouraging to shareholders.

The cement company is a traditionally consistent earner and this year will not prove an exception to the rule. As a matter of fact, the forecast is for 1925 results to be about the same or a little better than a year ago. This would mean that the company has earned somewhere between $2,200,000 and $2,500,000, and after bond interest and preferred dividends will have net available on the common of something like $1,150,000, or $1,125,000, equivalent to around 8½ to 9%.

Apart from the cement business itself, it is understood that the company's income from other companies and investments has been considerable.

One development in connection with the company of more than passing interest is the fact that it is steadily developing its export market for cement and shipments this year have been made to no less than 27 countries. While the volume of such business is not especially large it is viewed as a most encouraging development, presaging better things during the years to come, providing as it does an additional market for Canada cement.

Consumers Company of Chicago Completes Refinancing Plans

REFINANCING of the Consumers Company was approved by the stockholders at their recent meeting without opposition. This provides for the retirement of $7,450,000 in bonds and notes and the sale of not more than $6,000,000 in new bonds and $2,500,000 in 6% notes; increasing the capital stock from the present 45,000 shares of preferred and 325,000 shares of $10 par common to 100,000 shares of prior preference stock of $100 par, 45,000 shares of preferred identical to the present issue, and 1,000,000 shares of common of $5 par value.

Under this plan each share of the present common stock can be exchanged for two of the new and the prior preference stock issue appears in place of a $3,000,000 note issue now outstanding which is to be retired. It provides also that back dividends on the preferred amounting to 7% shall be paid as soon as the plan becomes operative. Officials point out that the chief advantage of the new structure is the lengthening of maturities and eliminating the necessity for sinking fund reserves over a period of the next five years, during which time it is hoped to materially strengthen the company's capital position.

Giant Portland Reduces Accumulated Preferred Indebtedness

THE directors of the Giant Portland Cement Co., Philadelphia, Penn., have declared a dividend of 10% (on account of accumulated preferred dividends) in addition to a regular semi-annual dividend of 3½% on the preferred stock, both payable December 15. A distribution of 3½% was made in June last, making a total of 17% declared this year on the preferred stock, compared with 14% paid in 1924. The dividends just declared will reduce accumulations to 19%.

Lake Shore Stone Products Co. in Receivership

FRANK P. KENNISON, vice-president of Ohio Savings Bank and Trust Co., Toledo, has been appointed receiver for the Lake Shore Stone Products Co. of Sandusky, Ohio, by Federal Judge J. M. Killits.

"Why Classified Sand Is Best"

UNDER the title "Why Classified Sand Is Best," the Stewart Sand Co. of Kansas City, Mo., gives a very clear and simple explanation of why one kind of sand is better than another for concrete aggregate in its house organ, *Better Building*. It is so well written and so logical that every sand and gravel producer will find in it a valuable sales argument for well-graded sand:

"If you had enough paint to cover 3000 sq. ft. of surface properly and you spread it over 5000 sq. ft., you wouldn't expect a top-notch job. Careful calculations show that 3000 sq. ft. is approximately the area of the surfaces of the grains in 2 cu. ft. of Stewart 'Classified' sand. The same amount of unclassified sand from the same source has, for the average grading, a surface area of about 5000 sq. ft.

"Let cement 'paste' represent the paint which must cover the grains of sand. Consider mortar made up of 1 sack of cement and 2 cu. ft. of sand. In the case of the classified sand there will be about 3 lb. of cement for each 100 sq. ft. of surface, while for the unclassified sand there is less than 2 lb.

"It is obvious that the coat of 'paint' on the classified sand will be much thicker than on the unclassified sand, and that consequently a better mortar will be produced.

"It has been found that the use of 3 lb. of cement per 100 sq. ft. of aggregate produced about 60% more strength than the use of only 2 lb.

"The reason for this difference will be apparent to all who are familiar with the recent researches of Prof. D. A. Abrams at Lewis Institute, which show that the strength of concrete depends on the quantity of mixing water expressed in terms of the cement. The more mixing water used the lower will be the strength. In order to make a given amount of cement cover 5000 sq. ft. it is necessary to thin it out with more water than would be necessary to make it cover 3000 sq. ft., and consequently the strength is lower.

"The reason for this important difference between classified and unclassified sand lies principally in the removal of the fines. The importance of ridding sand of excessive amounts of fine material will be readily appreciated when it is considered that the surface area of a given weight of sand finer than a 50-mesh sieve is four or five times greater than the same amount of sand coarser than the No. 50. Of course, some fine material is necessary in order to obtain proper workability, but any amount more than required for this purpose should be avoided.

"Stewart 'Classified' sand is scientifically prepared to furnish the proper balance between the requirements of workability and the grading which will be most economical of cement."

Fort Scott Residents Ask Injunction Against Cement Plant

A NUMBER of residents in the neighborhood of the plant of the Fort Scott Hydraulic Cement Co. at Fort Scott, Kans., have filed suit in district court for an injunction to prevent the continued operation of the plant, on the ground that smoke, soot, gas, noxious vapors, heat and dust from the plant detract the value of residence property in the locality, and also are injurious to health.

The plaintiffs, who are property owners, say that their homes are on paved streets, and are otherwise desirable as residences, except for the alleged smoke and dust nuisance claimed to be caused by the cement plant.

It is charged that the plant is operating nights and days and Sundays and that smoke and dust from the smokestacks and kilns of the plant are blown onto the premises of the plaintiffs, and into their houses and other buildings, rendering them uncomfortable and unhealthful and unfit for habitation. It is claimed that the dust and smoke have damaged the houses and their contents, and that new paint on houses in the vicinity rapidly becomes discolored.

The plaintiffs ask an injunction against the further manufacture of cement by the plant at their location.

The suit is brought against Mrs. Mary J. Thomas, Howard M. Thomas, and Grace Thomas-Penniman, doing business as the Fort Scott Hydraulic Cement Co. —*Fort Scott (Kans.) Tribune.*

Alpha Portland to Improve Ironton Plant

PRELIMINARY plans for the extensions and improvements to the Ironton, Ohio, plant of the Alpha Portland Cement Co. have been drawn. The new installations include a power plant to be run by waste heat boilers. Contract for the turbines and boilers has already been let. The total cost of the changes to be made will amount to about $900,000.

Cost of Crushing on a Large Scale

At the Magma plant of the Utah Copper Co., near Garfield, Utah, the coarse-crushing unit has a capacity of 24,000 tons of run-of-mine steam-shovel ore per day. The following per-ton costs, however, were made when crushing only a moderate tonnage to pass a ¾-in. ring. Overhead expense is not included:

Operating labor	$0.01053
Car dumper	0.00072
Crushers	0.00294
Feeders and conveyors	0.00747
Screens	0.00173
Secondary rolls	0.00737
Electric power	0.00828
Total	$0.03904

—*Engineering Mining Journal-Press.*

Developments in Magnesia Cements

METHODS of making satisfactory plastic magnesia, used extensively in the manufacture of stucco and composition flooring, from the magnesite deposits of the Western States have been developed as the result of an investigation conducted by the Bureau of Mines, Department of Commerce. The investigation also revealed that plastic magnesia of fair quality could be produced from dolomite, a material cheaply obtainable in the Eastern States, where the market for plastic magnesia is largest. The experimental work of the Bureau of Mines was conducted with magnesite from Washington and California, with the view of aiding American producers in establishing a domestic industry to compete with material heretofore largely imported.

The first commercial use of magnesian cements was in Germany, the Bureau of Mines points out in a report just issued. Their use in the United States was just being established at the beginning of the World War, but is gaining rapidly at present. Most of the plastic magnesia now made from domestic magnesite comes from California producers.

Recarbonation of free lime in burned dolomite or plastic magnesia, in order that these materials will yield satisfactory magnesian cements, has proved of great value for dolomites, but of doubtful value for magnesites.

The big centers of consumption of plastic magnesia are in the Eastern States, whereas the only producing districts of the country are in California and Washington. On the other hand, large supplies of good dolomite are available in the East and the Bureau of Mines tests have shown that recarbonated dolomite makes very satisfactory stuccos. Dolomite does not contain enough magnesia for flooring cements. However, since 80% of the plastic magnesia sold is used for stucco, recarbonated calcined dolomite could satisfactorily supply most of the demand for plastic magnesia.

Research undertaken to show the suitability of Washington crystalline magnesite for the manufacture of plastic magnesia, while accomplishing its purpose definitely and satisfactorily, incidentally discovered a process for using dolomite in magnesian mortars which may well prove commercially important. This discovery indicates a use for vast deposits of pure dolomite near eastern consuming centers and may revolutionize the magnesian mortar industry.

The results of this investigation are contained in Bureau of Mines Bulletin 236, "Plastic Magnesia," by Oliver C. Ralston, Robert D. Pike, and Lionel H. Duschak, copies of which may be obtained from the Superintendent of Documents, Washington, D. C., for 30 cents.

Ammunition for Sales Promotion of Limestone and Gypsum for Dusting Coal Mines

THE principal competition of producers of limestone and gypsum dust for dusting coal mines as an explosion preventive comes from the mine owners who are making and using shale dust. As we have pointed out in these columns before, shale is objectionable because it contains silica, and wide-awake producers of limestone and gypsum could eventually overcome its use, as a health hazard, if in no other way.

Such producers will find very helpful a new publication of the Bureau of Mines, Department of Commerce, entitled "Silicosis Among Miners," by R. R. Sayers.*

Some dusts, when breathed, irritate the lungs and cause a disease known by the general name of "pneumoconiosis." This lung disease is called "silicosis" when it is due to breathing rock dust containing silica.

While the use of shale dust in coal mines as an explosion preventive is not referred to, it is obvious from the description of the disease given that this can and will be a cause, where shale dust is used. The booklet describes the causes, effects, and prevention of the disease. A general knowledge of the subject should certainly prove useful to the salesman of limestone and gypsum dust, which is now generally believed to be healthful to breathe rather than otherwise.

*Technical Paper 372, U. S. Bureau of Mines; price 15 cents; Superintendent of Documents, Government Printing Office, Washington, D. C.

Colorado Portland Cement Company Makes Large Shot

WE have just received an interesting letter from E. J. Stock, superintendent of the Colorado Portland Cement Co., Portland, Colo., concerning the details of a large blast made recently at their quarry. He says:

"We had 73 holes in the lime facing the Arkansas river. These holes were about 80 ft. deep. We loaded 10,950 lb. of gelatine in the bottom of these holes as the water stood in the bottom. The balance was loaded with 5000 lb. of Titan "D" and 23,550 lb. of Quarry Special, all powder being manufactured by the Hercules Co. Seven thousand nine hundred eighty-four feet of Cordeau-Bickford was used to detonate the shot.

The limestone lies in layers almost horizontal, the maximum thickness being about 30 in. for the two heaviest layers, the rest of them being from 6 to 18 in. in thickness. Somewhat over 200,000 tons of limestone were brought down and the fragmentation is about the best we have had. We have no picture worth mentioning as the professional photographer bogged down in a snow bank before getting here.

"The material was nicely spread out on a gentle slope and all things considered appears to be the best lime shot we have had. The total of powder, 19¾ tons, is the largest amount every shot in this part of the world at one time."

R. C. Towles Heads Agricultural Department of American Cyanamid Company

R. C. TOWLES, recently head of the agricultural department of the National Lime Association, and assistant general manager of the Association, is now in charge of

R. C. Towles

the agricultural department of the American Cynamid Co., with offices at 511 Fifth avenue, New York City.

He will have supervision of experimental and investigational problems in connection with the promotion of the fertilizer products of this company.

Cynamid is an air-nitrogen product made at Niagara Falls, Ont., from hydro-electric power generated at the Falls. The company also has "ammo-phos" (ammonium phosphate) works at New York and phosphate mines at Brewster, Fla.

The good wishes of Mr. Towles' many friends in the lime industry go with him in his new work.

No Accident Drives in the Industries

THE October issue of Labor and Industry, published by the Pennsylvania Department of Labor and Industry, features the efforts and methods used by various industries in the prevention of accidents at the plants. It contains many illustrations of the publicity used, training of employes and types of safeguards, both for personal use and on different equipment.

Among other things of interest in the publication are the reports of the Beaver Valley Traction Co. and the Duquesne Works of the Carnegie Steel Co. on their recent no-accident campaign. David Van Schaack, director of the Bureau of Inspection, Accident and Accident Prevention, Aetna Life Insurance Co., has written a valuable paper on the relationship between the number of accidents to the number of new employes. There are also charts on comparative accident trends through successive months of several years and for the past five years. Copies are available on application to R. H. Lansburgh, secretary of the Department of Labor and Industry, Harrisburg, Penn.

Steel Company to Open Limestone Quarry

THE Bethlehem Steel Co. will in the near future start quarrying stone on an extensive scale from quarry land it purchased some time ago in Upper Merion township. It is said large crushers will be erected on the site, and that the quarries will be run steadily in extracting stone for the company.

The Bethlehem organization, it is said, made the purchase of the quarry to get the entire output of stone for the steel plants. This company had been buying stone here for a long time, but was unable to get a sufficient supply.

It is believed next year there will be an additional number of men put to work at the quarries.—*Norristown (Pa.) Herald.*

Dixie Plant Receiving Additional Improvements

THE Dixie Portland Cement Co.'s plant at Richard City, Tenn., is undergoing additional changes that will bring it completely up to the rank of the most modern cement making operations in existence.

The company is now in the midst of installing new major electrical equipment and will abandon its power house. All of the larger motors, carried on direct current, will be replaced with eleven new super-synchronous units. Power will be purchased, and the original power plant will be kept in condition and used only as a stand-by for emergeny use. It is expected the new equipment will be installed and in operation by February 1.

The company's new quarry is now in excellent condition, being opened to a length of approximately 1600 ft., with a face averaging about 70 ft. in height, although at the highest point the blast-hole drills are now putting down 98-ft. holes.

The raw end of the plant, including the crushing department and storage, has been completely rebuilt and is most modern in every respect. According to officials of the company, an appropriation has been made for the purchase of two large kilns which will be installed alongside the ten 8x110-ft. kilns that were installed when the plant was first built.

First Annual Southwest Road Show and School To Be Held at Wichita

PLANS are being completed for the first annual Southwest Road Show and School to be held at Wichita, Kan., on March 2 to 6 inclusive. The show will be held under the auspices of the Wichita Thresher and Tractor Club of Wichita. The entire Coliseum located in the center of Wichita has been engaged for the purpose. It is estimated that there is available over three acres of space for exhibition purposes. There are excellent facilities for the easy loading and unloading of exhibits and the docks are close to the exhibition building.

It is expected that the show will be attended by approximately 100,000 men actually engaged in road construction and maintenance in the five states adjacent to Kansas. These states, including Kansas, have under process of construction over 40,000 miles of state highway and are said to have available for further road construction in 1926 over $67,000,000.

In conjunction with the show, there will be held a good road school. This will be under the direct supervision of the Kansas State Highway Commission and the engineering department of the Kansas State Agricultural College with the cooperation of adjacent state and federal highway engineers.

All space for exhibition purposes will be reserved on the ground floor of the building. Details of rates for reservations, space, etc., can be obtained by writing to the Wichita Thresher and Tractor Club, Inc., P. O. Box 1043, Wichita, Kan.

Michigan Highway Department Investigates Gravel Resources

THE Gladwin County, Mich., road commissioners recently received the detailed report of the state highway department on the gravel resources of that county. The investigation was carried on as a preliminary to the proposed section of new concrete road to be built there. The conclusion seems to be that the gravel deposits in Gladwin county tend to be small with a few exceptions and for the most part are characterized by rather fine material, excellent for gravel roads, but not coarse enough for concrete pavement.

Following is a brief description of the various locations investigated.

Location No. 1. Not recommended because of fineness of gravel.

Location No. 2. Not recommended because of heavy stripping and fineness of material.

Location No. 3. Not recommended because of soft rock and fineness of gravel.

Location No. 4. Not recommended because of sand waste involved.

County Pit. Gravel taken from this pit for the piece of M.-18 concrete from near north city limits through city of Gladwin. The pit is located on the beach but the stone is very good, little soft material being present. The material is, however, very sandy and is reported to run ⅔ sand and ⅓ gravel. This is indicated by the enormous amounts of sand piled in and around the pit. Five or six screens were used at the time of the building of the concrete through Gladwin and the sand removed by means of a conveyor. Now, however, this cannot easily be done because of the amount of sand already present and handling of the sand would involve considerable expense.

Location No. 5. Not recommended because of sandy character and fineness of the material.

Location No. 6. Haul one mile to county line over dirt road with steep grades. Recommended for consideration.

Location No. 7. Not recommended because of limited amount of material suitable for concrete.

Location No. 8. Not recommended because of limited amount.

Location No. 9. Not recommended because of the fineness of the material.

Location No. 10. Haul 1¼ miles to county line over gravel road. No grades. Recommended for consideration.

Location No. 11. Not recommended because of worked out character.

Location No. 12. Not recommended because of sandy character.

Location No. 13. Not recommended because of limited amount.

Location No. 14. Not recommended because of worked out character.—*Gladwin (Mich.) Record.*

National Sand and Gravel Association Convention

ADVANCE information as to the program for the National Sand and Gravel Association Convention is to the effect that it will be one of the best that has been presented at any convention. The great progress that the association has made in the past year will be reflected in the character of the addresses and papers that will be heard and discussed by the members and their friends.

No producer but what will feel the influence of the work of this convention, either directly or indirectly, and hence no producer who can attend should fail to be present.

Atlanta is a delightful city and especially so in the winter season. The Atlanta - Biltmore Hotel, in which the convention is to be held, is one of the best in the United States. Reservations should be made early in order to be certain of accommodations.

Every producer, whether a member of the association or not, will be welcome. The dates of the convention are January 21 and 22.

Iowa Gravel Plant Damaged by Fire

ONE of the plants of the Automatic Gravel Co., near Muscatine, Iowa, was severely damaged by fire recently and which caused a loss of over $40,000. A short circuit in an electric wire is believed to have started the blaze. The loss is partially covered by insurance.

Fred O. Block of Davenport is president, and the W. G. Block Coal Co. of Davenport is sales agent for the firm. Two Muscatine fire trucks were sent to the scene and prevented the flames from destroying the larger plant. Water was pumped 2000 ft. from a gravel pit.

Among the equipment destroyed was a new drier used in preparing gravel for railroad use. Several road projects in the county will be held up some time as the result of the fire, the Automatic Gravel Co. having the contract to supply the gravel.

The plant will be rebuilt as soon as insurance adjusters have completed their inspection. Repairs will probably be completed some time this winter, according to D. G. Asthalter, manager.

Missouri Gravel Company Closes Successful Season

THE Missouri Gravel Co. of La Grange, Mo., closed its first season's operations, so far as the pumping of gravel is concerned, and the main part of the company's fleet, consisting of the *Str. Pearson*, three barges and the quarter boat, left for Moline, Ill., under command of Captain Young. Two pump boats, one barge and a spud boat were taken to Quincy to winter in the bay there.

According to Superintendent Ray Bergerson the company has had a successful season, considering the usual handicaps incidental to the operation of a new plant, and has shipped about 2300 carloads of material to Missouri and Illinois points, all of which has been pumped from the river bed.—*La Grange (Mo.) Indicator.*

Missouri Valley Producers to Meet December 17

THE annual meeting of the Missouri Valley Association of Sand and Gravel Producers will be held in Kansas City, Mo., Thursday, December 17, at the Kansas City Athletic Club. Only one day is allotted for the convention, so it is requested that everyone be on hand at 9:30 a.m. when the meeting begins. The entertainment features which have been such a success in other years will be a feature of this year's program.

Federal Investigation of Bankrupt Continental Rock Asphalt Co.

WORD comes from Louisville, Ky., that the Post Office Department has begun an investigation of the failure of the Continental Rock Asphalt Co. of Kentucky, in which many St. Louisians were investors and in which Fred Essen, county politician is said to have been interested, and his son Roy, at one time a director. The investigation is to determine whether the facts warrant action by the federal grand jury.

The capital stock, $300,000, is now worthless. Creditors will receive about 75 cents on the dollar through the sale of the corporation's assets for $23,000 at a recent auction.

Postoffice Inspector Greenaway is interviewing stockholders to learn from whom they purchased stock and what statements were made as to its value and prospects. If the stockholders present proof that fraudulent misrepresentations were made, the evidence will be placed before the federal grand jury which convenes in Louisville, Ky., March 8, District Attorney Ball of that city is quoted as saying.

Officers of the company, according to records on file with the state banking commissioner at Frankfort, Ky., are: A. D. Reid, St. Louis, president; J. E. Waddell, address unknown, vice-president, and Philip B. Hill, Leitchfield, Ky., secretary-treasurer. Directors, in addition to the officers, are: John Jannopoulo and E. C. F. Koken, St. Louis; Roy Essen, Clayton, and C. F. Bloker, Caruthersville, Mo.

Why Stock Did Not Sell

A permit to sell $70,900 of the company's stock in Kentucky was issued by the state banking commissioner in January, 1923. The stock was not bought up as quickly as expected, because of the unprofitable operations of other asphalt producers, whose stock already was on the market and below par.

In February, 1923, Fred Essen appeared before the blue sky commissioner at Jefferson City, with W. A. White of Louisville, then president of the Continental company, and applied for a permit to sell $50,000 of its stock in Missouri. The permit was issued, but was revoked last March 1, when the company failed to furnish the required statement of its condition.

White, at the time of application, said all the stock had been subscribed and the application was merely a formality to legalize fulfillment of pledges to purchase stock. White said the Essens had been interested in the firm for six months, and Ed Morrow, then governor of Kentucky, was one of the largest stockholders. Many road contractors were financially interested in the company, and even before the plant was opened, had obtained for it $850,000 worth of orders for rock asphalt, according to White.

The company had been incorporated under the laws of Kentucky in October, 1921, one of its promoters being A. L. Lampton, a local contractor. The officers and directors were from Kentucky and Tennessee. Later Essen and his associates gained a controlling stock interest, and Reid succeeded White as president, and the directorate was filled with Missourians. It is understood some of the stock sold to St. Louisians was part of the personal holdings of White, Waddell and Lampton. The corporation's books indicate the $300,00 stock was paid for in cash and notes mostly.

A plant was erected at Big Clifty, Grayson county, about 70 miles from Louisville. Several other asphalt companies located in Grayson county and nearby fields and the asphalt boom grew.

Too Much Oil in the Asphalt

Geologists reported evaporation of petroleum had left great deposits of rock asphalt. The evaporation had not progressed far enough so far as the Continental's acreage was concerned, and its failure was attributed partly to an excess of oil in its product, which kept it from being as hard as desired.

An involuntary bankruptcy petition was filed against the company by creditors in October, 1924, and Federal Judge Moorman adjudged it bankrupt. Allegations made by the creditors and denied by non-resident officers, were that President Reid in August, 1924, became a preferred creditor by paying himself $2000 which he claimed was due him, and that the company was insolvent and had admitted in writing its inability to pay debts and its willingness to be adjudged bankrupt.

During the proceedings, Secretary-Treasurer Hill, the only officer living in Kentucky, made affidavit that "the officers and directors practically abandoned the enterprise months before the filing of the petition in bankruptcy and left me to conduct the business without advice or assistance and without any funds which were necessary to carry on the business."

In support of his assertion that the other officers of the company lacked interest in its fate, Hill said he had written 55 letters to them in the few months preceding and following the bankruptcy suit, and had received only five answers.

At a bankruptcy sale held recently before Referee Wilkins at Leitchfield, the company's plant and other assets were sold for $23,000 to a competitor, the United States Rock Asphalt Co., which plans to enlarge the plant and operate it. Terms of the sale were $8000 down and the balance in six months, making possible payment of approximately 75% of the claims, which were around $30,000.—*Clayton (Mo.) Leader.*

Allentown Friends Congratulate W. E. Erdell, of the Penn-Allen Company

THE recent sale of the Penn-Allen Cement Co. to the Dexter Portland Cement Co. for a reported $2,000,000 is supposed to have added another millionaire to the list of Allentown, Penn., residents. The sale is said to be an entire cash transaction.

William E. Erdell, the president and developer of the Penn Allen, owned about 51% of the stock, and receives upwards of a million. Mrs. William R. Yeager, the next largest stockholder, gets upwards of half a million, and Benedict Nuding somewhat more than a quarter of a million. The remaining $200,000 goes mostly to the plant managers and the men in the office who had invested in the stock.

Not many years ago the Penn Allen went in the hands of receivers, and a good many of the original stockholders quit. Mr. Erdell was then managing another mill. He finally accepted an offer to take charge, and he then declared his belief he could put the concern on its feet. When he took charge of the Penn Allen, he had little more than ability and ambition, but they soon began to tell, and it was not long before he was able to go to the banks and secure hundred thousand dollar loans.

Some friends suggested it might have been wise to continue in the business, since it is in the best of shape and demand for cement is great, owing to the rapid construction of concrete roads. To this Mr. Erdell replied he thought it wise to sell on such terms as were offered by the purchaser.

When Mr. Erdell assumed charge of the Penn Allen, only a few of the old stockholders remained in the venture. The Penn Allen plant is not a large one, but Mr. Erdell always kept it in tip-top condition and kept close tab on the business, which accounts in good measure for the price received. The Dexter Portland Cement Co., with the addition of the Penn Allen property will have a capacity of 7000 bbl. per day.—*Allentown (Penn.) Leader.*

New National Cement Mill

THE National Cement Co., of Montreal, Can., is soon to have a modern, 3000-bbl. dry process mill in production. The new plant will be completely electrified, power being purchased from a local company.

Complete electrical equipment for the operation of the quarry and mill has been purchased from the Canadian General Electric Co., including several motors of 200, 300, 350 and 500 h.p. The 500-h.p. motors, four in number, will drive tube mills and are of the super-synchronous type, correcting the power factor of the induction motor load.

Full provision has been made for doubling the capacity of the plant without disturbing the present layout. A waste heat power plant is contemplated and provided for in the general plan.

Cement Products

Concrete Building Units on the West Coast

Climate and Building Codes Have Caused the Development of the Poured Tile

By Edmund Shaw
Editor Rock Products

THE concrete block and tile industry has developed very rapidly in the United States during the last four or five years. Revisiting the west coast after an absence which included that period one naturally expected to find that the development there had kept pace with the rest of the country, since building had increased so rapidly and especially since the west coast is so ready to experiment with new methods and materials. But inquiry showed that this was not the case. The concrete block industry has lagged behind the cities of the Atlantic Coast and the Middle West. Many reasons were given for this, among which are that clay products are cheap and manufactured on a large scale; building codes have been drawn to shut out ordinary forms of concrete block, and concrete block got a bad reputation in the beginning from the market being flooded with "back yard" products which were poorly made and often so weak that they could be crumbled with the fingers.

Other forms of concrete products than building units have progressed rapidly. Concrete septic tanks, burial vaults and garbage incinerators are made in large quantities. Some of the handsomest examples of concrete trim stone are to be found in all the cities on the coast from Seattle to Los Angeles. Concrete pipe are made on a really enormous scale, one plant near Los Angeles consuming 40,000 bbl. of cement a month in making pipe. It is only in the building unit that the products industry has lagged.

Office and yards of the Filmore-Wiley Co., Los Angeles

However, there is one form of building unit which has developed beyond all the others and that is the poured block or tile, as it is usually called. The mild climate and the building code of Los Angeles are responsible for its development in that city and for the spread of its use to San Francisco, Portland and Seattle. It is usually made out of doors in yards that cover a large area. In a cold climate such yards might be covered and the interior heated but this would be expensive. Hence the climate aided in the development of the business. The part played by the building code was that of forbidding the use of block or tile which would absorb more than 10% by weight of water. The ordinary tamped or pressed block will absorb considerably more; the poured tile considerably less. About 5½% is the average absorption from figures furnished by the makers of such product.

Several systems of making poured block have been worked out but two are standing

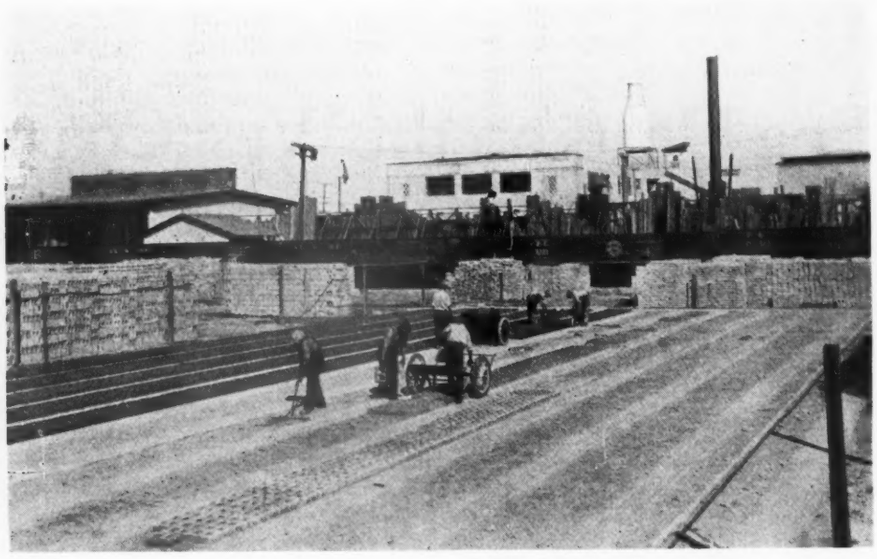
Office and yard of the Sunset Tile Co., Redlands, Calif.

the test of commercial production, known as "Stonetile" and "Supertile." "Stonetile" are made on sand beds by the use of steel molds which are removed almost as soon as the block is poured and placed in position for molding others.

The Filmore-Wiley Co. is perhaps the largest producer of "stonetile," its output running to 10,000 daily. It buys its aggregate, about 2000 tons a month, in the form of sand and roofing gravel, which is about ⅜-in. in. diameter. The sand is a good grade of concrete sand and the mix is 1:1½:3.

Wet concrete has a "slump" and on seeing the molds removed from the freshly poured block one looks for them to sag. But the concrete is mixed so as to have only a half-inch slump and what little slump there is when the mold is removed merely squares up the block. The molds are made with a slight "draw," so that the blocks would be slightly smaller at the top than at the bottom if the slump did not settle the block so as to make the sides vertical.

At the Filmore-Wiley plant there are three groups of beds, two of eight and one of 12 beds. Each bed is 36 in. wide and about 200 ft. long. It is separated from its neighbor by a 24-in. strip of concrete that acts as a track on which the machines roll that spread the concrete and that pick up and transfer the molds.



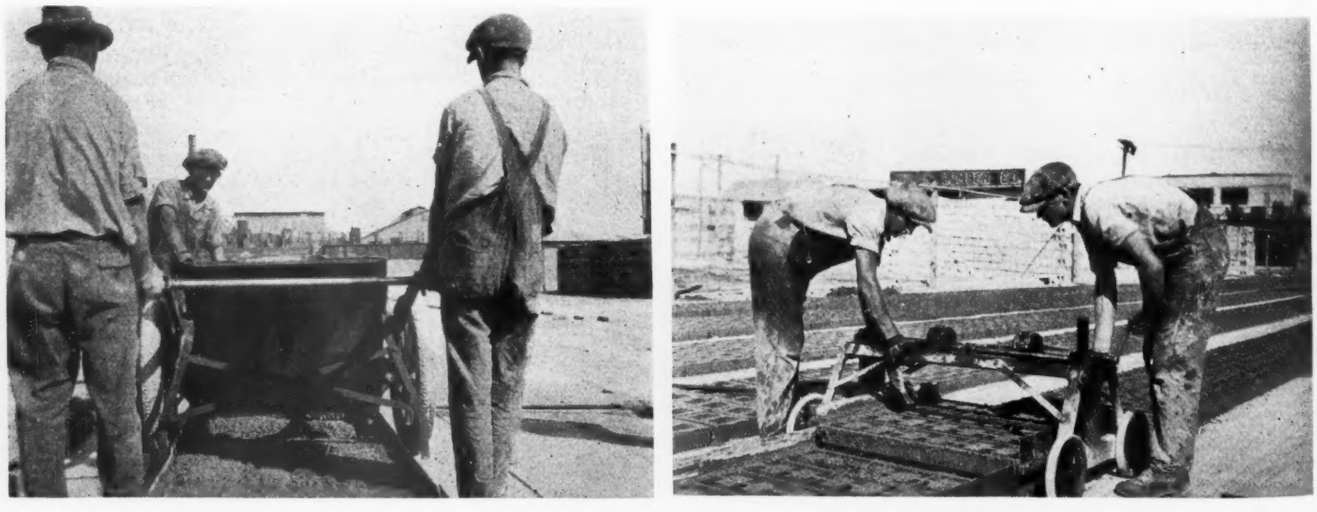
A "Stonetile" yard. The men in front are removing cured blocks; those in the rear are molding new blocks. The man with the brush is cleaning the concete track

"Supertile" do not vary much in appearance from "stonetile" except that they present a somewhat smoother surface as they are cured in the steel molds in which they are poured. The method has the advantage of using less area although it demands more machinery and steam kilns for curing. The molds are placed on an ingenious stacking machine, and as they are filled they are wheeled on this machine to the kilns where these are placed on racks for curing. The steam curing is of the intensive sort for in three hours the blocks are hard enough to be removed to the yard and stacked for the usual open-air curing with daily sprinkling. Both "stonetile" and "supertile" are held at least 14 days in the yard before delivery. The mix for "supertile" is usually 1:2:4. A description of "supertile" making at the plant of the Sunset Tile Co. in Redlands, Calif., will be published in an early issue.

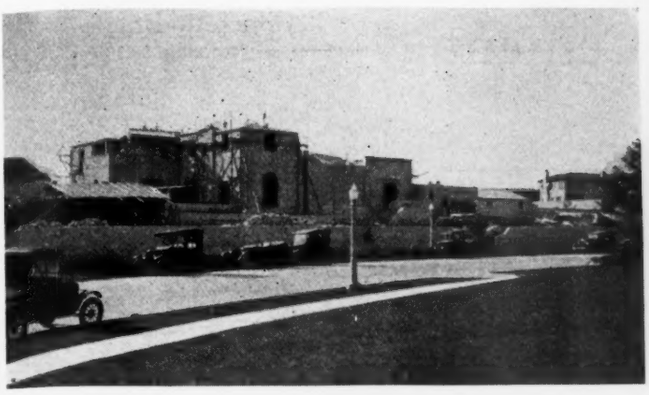
Poured tile are all 12 in. long and 3⅝ in. thick and they are made in 6-in. and 8-in. widths. They are cored so that the walls of the tile are 1½-in. thick, about 30% of the volume being in the core. The weight of the 8-in. tile is 16 lb., a little less than one-third of the weight of the ordinary standard 8x8x16 tamped block. The present price is $65 per thousand, which is equal so far as volume is concerned to 8x8x16 block at 21 cents. But the tile price is for three units instead of one.

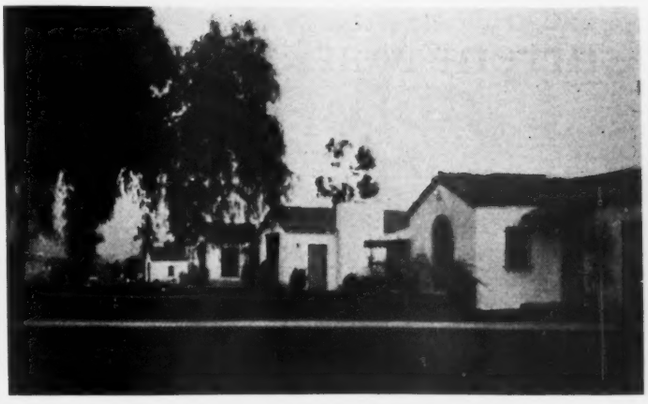
The size of the block is about that of the 12-in. *adobe* used in Spanish and Mexican architecture which also fits in well with the locality. A tile wall laid with rough mortar joints and painted white has all the charm of the old Spanish architecture. The face may be colored in other ways, a favorite method being to stain the surface with acid and an oxide of iron. But in many buildings the exterior surface is covered wtih stucco.

The real competitor of concrete tile, in Los Angeles at least, is not brick but timber. Lumber is cheap on the West Coast and carpenter's wages are low. More houses are built to sell than to be occupied by owners and the speculative builder looks for the lowest cost house that will have a sufficiently good appearance to "get by." However, that is not always the case. A handsome group of concrete tile houses in Altadena is being put up at the present time and sales are said to have been made at prices which will yield a profit beyond the ordinary. This means that it is possible to find buyers who will pay and pay well for a permanent and substantial home.



Left—Pouring "Stonetile" from a buggy of concrete. The concrete has a slump of 1/2 in. to 1 in. Right—Pulling the molds which will be wheeled ahead to be filled again





Left—A handsome modern residence in Los Angeles which will contain 150,000 poured tile. Right—Group of poured tile houses which proved that buyers will pay for permanency

The prevailing architecture in California is Spanish, which is based on masonry. It is cleverly imitated by frame and chicken-wire and stucco but when one *knows* that it is of such flimsy construction the house loses its charm. One needs to feel that the wall is solid. And the concrete tile supplies the unit that will give the required solidity and permanency at the lowest cost.

It is being appreciated to the extent that it is used in some of the finest residences. One under construction as this is written, which it is said will cost $300,000, will contain 150,000 tile.

The writer saw just one example of the sort of pressed block that has given such building units a bad name. A building was being put up of such blocks in a small town about 60 miles from Los Angeles. It was one of the "patent" sorts that is laid by unskilled labor without mortar, the blocks being bound together by "slushing" mortar through the core holes. The block was made of sand with just enough cement to hold it together and it could be broken by the fingers. Whatever the possibilities of such a system of laying up block in other places, in this place the result was that walls and columns were badly out of line and out of plumb as the photograph plainly shows. If the earlier attempts at concrete block construction resulted as badly, it is no wonder that the pressed or tamped block was heartily condemned.

Increased Erection of Concrete Silos Seen as Indicator of Stabilization of Farming

ONE of the indications of returning farm prosperity and stabilization of farming operations is seen in the renewed interest in silage feeding and increased silo building, according to A. J. R. Curtis of the Portland Cement Association.

"Just before the war and during the war period, silos engaged the attention of farmers who were studying ways and means of increasing farm efficiency. Although this interest lagged somewhat in the past two years, and especially during 1925, evidence appears on all sides that silos and silage feeding are again being given serious attention by all those interested in agriculture," Curtis states.

Speaking of the advance in silo practice, Curtis said "Since the silo was introduced years ago, betterments have come steadily. The early silos were crude affairs and oftentimes of temporary construction. During the last few years, under intensive investigation and research, the silo has progressed to the point where it is permanent, proof against wind, storm, fire and the elements.

"Materials have been improved and adapted to silo needs until at present there is a type of silo suited to every locality and requirement. This advance is especially true of concrete and concrete products. New shapes, sizes and designs of the concrete units have been brought out and the general quality of the product increased.

"An interesting feature of the newest concrete silos is the provision made for insuring a smooth inside surface, or, increasing the 'slip,' as it is commonly termed. This facilitates settling of the silage. Special processes in making the blocks and treating them after being placed provides this feature.

"This betterment is noticeable in all the types of concrete silo, including the stave, monolithic, block, tile and brick. With better silos and conditions that warrant use of silage for feeding, the economical importance of the silo becomes even more pronounced."—*St. Louis (Mo.) Globe-Democrat.*

Nebraska Concrete Products Association to Meet at Omaha

AT a recent meeting of the Nebraska Concrete Products Association held in Lincoln, Nebr., it was decided to hold the annual convention of the association at the Rome hotel, Omaha, on February 11 and 12, 1926.

An interesting program has been arranged and all who are interested in concrete products are invited to attend this convention.

All correspondence and particulars regarding the convention will be furnished by F. R. Willsey, secretary, Hunter Inn, Omaha, Nebr.

The kind of construction that gives tamped block a bad name. Put up by unskilled labor, everything is out of plumb

Current Market Prices of Cement Products

Concrete Block

Prices given are net per unit, f.o.b. plant or nearest shipping point

City of shipping point	Sizes 8x8x16	8x10x16	8x12x16
Camden and Trenton, N. J	.....	.19‡	.30‡
Columbus, Ohio	.16@.18a	.....	.....
Detroit, Mich.	16.00*	.....	25.00*
Forest Park, Ill.	18.00*	23.00*	30.00*
Graettinger, Iowa	.18@.20	.....	.....
Indianapolis, Ind.	.13@.15†	.....	.....
Los Angeles, Calif.	4x3½x12—.03;	6x3½x12—.04½;	8x3½x12—.05½
Oak Park, Ill.	.18@.21a	.....	.....
Somerset, Pa.	.20@.22	.....	.....
Yakima, Wash.	20.00*	.....	.....

*Price per 100 at plant. †Rock or panel face. (a) Face. ‡ Delivered.

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00@35.00
Baltimore, Md. (Del. according to quantity)	15.50	22.00@50.00
Camden and Trenton, N. J.	17.00	
Ensley, Ala. ("Slagtex")	14.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Friesland, Wis.	22.00	32.00
Longview, Wash.	18.00	25.00@50.00
Milwaukee, Wis.	15.00	25.00@45.00
Mt. Pleasant, N. Y.		14.00@23.00
Omaha, Neb.	18.00	30.00@40.00
Pasadena, Calif.	12.50	
Philadelphia, Penn.	†15.25	‡21.50
Portland, Ore.	15.00@17.00	25.00@150.00
Prairie du Chien, Wis.	15.00	22.50
Rapid City, S. D.	18.00	25.00@50.00
Waco, Texas	16.50	32.50@125.00
Watertown, N. Y.	21.00	35.00
Wauwatosa, Wis.	14.00	20.00@42.00
Winnipeg, Man.	14.00	22.00
Yakima, Wash.	22.50	

†Gray. ‡Red.

Current Prices Cement Pipe

Prices are net per foot f.o.b. cities or nearest shipping point in carload lots unless otherwise noted.

Culvert and Sewer	4 in.	6 in.	8 in.	10 in.	12 in.	15 in.	18 in.	20 in.	22 in.	24 in.	27 in.	30 in.	36 in.	42 in.	48 in.	54 in.	60 in.
Detroit, Mich.*	.13½	.20¼	.31½	.47¼	.60¾	1.08	1.62¼	1.95	2.60	2.92½	3.00	3.30	3.75	5.40	6.50	.....	.....
Graettinger, Iowa (drain tile)	.....	.056	.075	.13	.175	.30	.50	.60	.80	1.00	.....	1.60	.....	.....	.....	.....	.....
Grand Rapids, Mich. (b)	.....	.....	.....	.60	.72	1.00	1.28	.....	.....	1.92	2.32	3.00	4.00	.....	.....	.....	.....
Houston, Texas	.....	.19	.24	.43	.55½	.90	.130	.....	†1.70	2.20	.....	.....	.....	.....	.....	.....	.....
Indianapolis, Ind. (a)	.....	.....	.....	.80	.90	1.10	1.30	.....	.....	1.70	.....	2.70	.....	.....	.....	.....	.....
Longview, Wash.					Sewer pipe 40% off list, culvert—list												
Mankato, Minn. (b)	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	1.75	2.50	3.25	4.25	.....	.....	.....
Mt. Pleasant, N. Y.	.....	.17	.26	.39	.50	.68	.93	1.29	.....	1.67	.....	.....	.....	.....	.....	.....	.....
Norfolk, Nebr. (b)	.....	.....	.....	.90	1.00	1.13	1.42	.....	.....	2.75	.....	3.25	5.00	.....	.....	.....	.....
Paullina, Iowa‡	.....	.....	.....	.....	.....	.....	.....	2.25	.....	2.11	.....	2.75	3.58	.....	6.14	.....	7.78
Tacoma, Wash.			4 in. to 18 in.			15 to 90 cents per foot											
Tiskila, Ill. (reinforced) (a)	.....	.....	.....	.65	.75	.85	1.10	1.60	.....	1.90	.....	.....	3.40	.....	.....	.....	.....
Wahoo, Nebr. (b)	.....	.....	.....	.....	1.00	1.13	1.42	.....	.....	2.11	.....	2.75	3.58	4.62	6.14	6.96	7.78
Waukesha, Wis.					4-in. to 24-in.—8.00 per ton												
Yakima, Wash.					$10.00 per ton												

*30-in. lengths up to 27-in. diam., 48-in. lengths after; (a) 24-in. lengths; (b) Reinforced; (c) Interlocking bar reinforced.
† 21-in. diam. ‡ Price per 2 ft. length.

Cement Tile

Prices are net per sq. in carload lots, f.o.b. nearest shipping point unless otherwise stated.

	Hawthorne tile, per sq.
Cicero, Ill.	
Red Spanish	10.00
Green Spanish	12.00
Red French	9.50
Green French	11.50

	—Cicero— Red	Green
Ridges	.25	.35
Hips	.20	.30
Ridge closers	.05	.06
Hip terminals, 3 way	1.25	1.50
Hip starters	.50	.60
Gable finials	1.25	1.50
Gable starters	.20	.30
End bands	.20	.30
Eave closers	.06	.08

	Camden and Trenton, N. J.—8x12, per sq.
Red	15.00
Green	18.00
Cement City, Mich. — 5"x8"x12", per M	55.00
Chicago, Ill.—per sq.	20.00
Detroit, Mich.—5x8x12, per C	8.00
Grand Rapids, Mich.:	Per 1000
5x4x12	45.00
5x8x12	70.00
5x8x 6	35.00
Graettinger, Iowa.—Cement tile per 100 ft.	
5-in.	4.50
6-in.	5.50
8-in.	8.50
10-in.	12.50
12-in.	17.50
14-in.	22.50
16-in.	30.00
18-in.	35.00
20-in.	40.00
22-in.	45.00
24-in.	50.00
Houston, Texas.—Roofing Tile, per sq.	
Red	17.00
Green	19.50
	Per 1000
5x4x12 (Lightweight)	45.00
5x8x12 (Lightweight)	80.00
Indianapolis, Ind.—9"x15"	
Gray	10.00
Red	11.00
Green	13.00
Longview, Wash.—(Stone Tile)	Per 1000
4x6x12	60.00
4x8x12	65.00
Mt. Pleasant, N. Y.:	Per 1000
5x8x12	78.00
Pasadena, Calif.:	Per 1000
4x4x12	$30.00
4x6x12	50.00
4x8x12	60.00
Waco, Texas:	Per sq.
4x4	.60
Wildasin Spur, Los Angeles, Calif.:	
4x3½x12	.03½
6x3½12	.04½
8x3½x12	.05½
Yakima, Wash.:	
5x8x12	.10

Concrete Buildings in Holland

ACCORDING to the British Journal, *Concrete and Constructional Engineering*, the director of housing of Amsterdam, Holland, has been investigating new systems of building houses of concrete and has recommended ten of them. The systems group themselves into concrete block construction, systems using special forms and systems using precast slabs so large that they have to be placed with a crane.

A noticeable feature of most of the methods is that the concrete used is of a porous nature. Where special porous aggregates are not used the aggregate is graded to render the concrete porous. The outer surface of such concrete is poured of a special impervious mixture.

Cement Products Field in Indiana Needs Development

"INDIANAPOLIS and central Indiana represent a vast undeveloped field for concrete products," said A. J. R. Curtis, Chicago, who is in charge of the national building activities of the Portland Cement Association, in a talk at a recent meeting of Indianapolis concrete products manufacturers at the Columbia Club of Indianapolis, Ind.

Indiana has been somewhat backward, particularly in recognizing the advantages of fireproof house construction, said Mr. Curtis, while over the country as a whole, the output of concrete masonry products was sufficient this year to build a row of story-and-a-half houses 4700 miles long. All Indianapolis needs is a proper introduction to these products to set the local concrete industry going at a new pace, he said.

The Indianapolis building department was complimented by Mr. Curtis, who said its careful policy with respect to building permits is a constructive effort to make Indianapolis one of the best built cities in the middle west. An extended policy of education, closer co-operation with builders and the generous use of advertising, reaching the best readers, were urged as means of benefiting both the building public and the concrete men.—*Indianapolis (Ind.) News.*

Chinese Cement Exportations Increasing

A RECENT report of the Department of Commerce says that China's exportation of cement for the first quarter of 1925 amounted to 353,901 piculs. A picul is 133⅓ lb. This was a 50% increase over the exports for the same period in 1924.

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning December 9:

Southern Freight Association Docket

24001. Slag and crushed stone. It is proposed to establish to Belhaven, N. C., a commodity rate of $2.03 per net ton on slag, carloads, from Longdale and Reussens, Va., and on crushed stone, carloads, from Eagle Mountain, Indian Rock and Rocky Point, Va., this rate being the same as at present in effect on crushed stone from Klotz, Va. The proposed rate to be subject to minimum weight of 100,00 lb. (when 90% of marked capacity is less than 100,000 lb., such 90% of marked capacity will apply as minimum), except when cars are loaded to their visible capacity actual weight will govern.

24039. Stone. It is proposed to revise rates on crushed or broken stone, carloads, from Yellow Rock, Ky., to Maysville, Ky., Lexington, Ky., and intermediate points on the L. & N. railroad to be in line with rates from other points. Statement of present and proposed rates will be furnished upon request.

24048. Limestone, ground or pulverized. Carloads, minimum weight marked capacity of car, from Cartersville, Ga., to Pass Christian, Miss. Combination rates now apply. Proposed, $3.04 per net ton, same as rate recently approved for application from Mascot, Tenn., and Ladds, Ga.

24094. Stone, crushed. It is proposed to establish a line of commodity rates on stone, crushed, carloads, subject to present description and carload minimum weight, from Mimms and Newson, Tenn., to stations on the Memphis line of the L. & N. railroad in lieu of the present commodity rates. Present and proposed to representative points are as follows:

	In Cents Per Net Ton of 2000 Lb.			
	Mimms, Tenn.		Newson, Tenn.	
	Present	Proposed	Present	Proposed
Trezevant, Tenn.	147	142	140	137
Milan, Tenn.	158	142	152	137
Humboldt, Tenn.	169	144	140	139
Bells, Tenn.	169	144	160	139
Brownsville, Tenn.	170	146½	160	141½
Bartlett, Tenn.	180	146½		

The proposed rates are based, from Newson 9 cents, and from Mimms, 14 cents per net ton higher than existing rates from Franklin, Tenn.

24104. Calcite (ground or pulverized limestone or marble). Carloads, minimum weight marked capacity of car, except when car is loaded to full visible capacity actual weight will apply, from Sparta, Tenn., to Corinth and Tupelo, Miss. Combination rates now apply. Proposed: To Corinth, $1.98; Tupelo, $2.12 per net ton based on the proposed Georgia scale, less 10%.

24151. Sand and gravel. Carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to their visible capacity, actual weight will govern from Western Railway of Alabama local pits to Panama City, Fla. Lowest combination now applies. Proposed: From Chehaw, Ala., $2.07; from Cloughs, Franklin, Baldwin Farms, Hornady, Milstead, Rice, Goodwyns, Shorters and Tysonville, Ala., $2.06; from Brassel, Oakview, Mt. Meigs, Arrowhead, Cocks, Madison Park and Cantelous Spur, Ala., $1.96 per net ton. The proposed rates are made on basis of the carriers' proposed Georgia-Alabama scale for application between trunk lines and short lines, using actual distance from each shipping point.

24153. Molding sand. It is proposed to take the commodity rates now in effect on molding sand, carloads, from Cincinnati, Ohio, Louisville, Ky., Evansville, Ind., Cairo and Metropolis, Ill., and points taking same rates to Marietta, Ga., as published in Agent Speiden's I.C.C. 702; also the rate from Paducah, Ky., to Marietta, Ga., as published in N.C. & St.L. Railway I.C.C. 2933A subject to Agent Jones' Combination Tariff I.C.C. U.S. 1.

24202. Granite or stone. Carloads and L11, 12 and 16, page 7 of S.A.L. Railway Stone Tariff I.C.C. A6855, from Berkley, Deadwyler, Elberton, Ethridge and Oglesby, Ga., to Lorain and Rocky River, Ohio. Present rates: To Lorain, Ohio, same as to Cleveland, Ohio, except granite or stone, curbing, flagging, etc., $4.81 and granite or stone monuments, tombstones, etc., $8.41; to Rock River, Ohio, combination rates; proposed, same as currently in effect to Cleveland, Ohio.

Central Freight Association Docket

11984. Sand, burn or refuse, foundry. Bremen, Ind., to Trebein, Ohio. Present rate, 20½ cents; proposed, $2.02 per net ton.

11985. To publish $1.51 per net ton on sand, blast, engine, foundry, glass, molding or silica, and $1.40 per net ton on gravel and sand (other than above). Carloads, from Steubenville, Ohio, to West Newton, Pa. Present rate, sand, blast, engine, foundry, glass, molding or silica, $1.76; gravel and sand (other than the above), $1.60 per net ton, per W. & L. E. Tariff I.C.C. 1510.

11989. Lime. Woodville and Gibsonburg, Ohio, to Andromeda, Rainbow and Judyville, Ind. Present, 24 cents to Andromeda and Rainbow, Ind., and 22 cents to Judyville, Ind.; proposed, 22 cents to Andromeda and Rainbow, Ind., and 17 cents to Judyville, Ind.

11998. Crushed stone. Spore, Ohio, to Newark, Ohio. Present, $1.10 per net ton; proposed, 80 cents per net ton.

12000. Crushed stone. Monroe, Mich., to Burgoon, Fostoria, Galatea, North Baltimore, Deshler, Hamler, Holgate, Napoleon, Ohio, and intermediate points north thereof and south of Toledo, Ohio. Rate per net ton. Present, to (Ohio) Burgoon, $1.12; Fostoria, $1.07; Woodside, $1.04; Bradnor, $1.07; Bowling Green, $1.04; Galatea, $1.07; North Baltimore, $1.12; Tontogany, $1.04; Deshler, $1.12; Hamler, $1.15; Holgate, $1.26; Malinta, $1.07; Napoleon, $1.07. Proposed, 90 cents per net ton.

12001. Sand (other than blast, engine, filter, fire or furnace foundry, glass, grinding or polishing, loam, moulding or silica). Cincinnati and Delhi, Ohio, to Wilmington and Loveland, Ohio. Present, $1.20 to Loveland, Ohio, and $1.30 per net ton to Wilmington, Ohio; proposed, $1.10 per net ton.

12010. Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel. Pleasant Lake, Ind., to P. railroad stations Maples, Ind., to Lima, Ohio, inclusive. Present rate, 90 cents per net ton; proposed, $1.00 per 2000 lb.

12027. Refuse sand for filling purposes. Sharpsville, Pa., to Greenville, Pa. Present rate, 70 cents per ton of 2000 lb.; proposed, 45 cents per ton of 2000 lb.

Southwestern Freight Bureau Docket

6560. Chatts, gravel, etc. From Joplin-Webb City, Mo., district to points in Oklahoma. To establish the following rates in cents per 100 lb. on chatts, gravel, etc., carloads, as described in Santa Fe Railroad Tariff 11232D, from points in the Joplin-Webb City, Mo., district to points in Oklahoma; Owen Junction, 7; Hulah, 8; Bowring, 9½; Bigheart, 11; Nanos, 12; Opah, 12½; Pawhuska, 13½. At present time there are no rates published to points on the Pawhuska branch of the Santa Fe, and it is desired to publish rates on the same basis as in effect to surrounding territory.

6603. Chatts and sand. From points in Missouri to Parsons, Kan. To establish a rate of 4 cents per 100 lb. on chatts and sand, carloads, minimhm weight as per St. L.-S. F. Railway Tariff 703-I, from Webb City and Joplin, Mo., to Parsons, Kan. Shippers have requested from Joplin and Webb City to Parsons on chatts, the same rates as now applicable to Strauss, Kan., which is next station to Parsons, Kan., and on sand the same rate as applicable from Galena, Kan., to Parsons, Kan.

Trunk Line Association Docket

12838. Sand. Carloads, minimum weight 90% of marked capacity of car, except when car is loaded to cubical or visible capacity actual weight will apply from South Vineland, Clayville, Millville, Menantico and Manumuskin, N. J., to Lambertville, N. J., $1.61 per 2000 lb.

Western Trunk Line Docket

4979. Sand, blast, engine, foundry, glass, molding and silica. Carloads, from Bear Creek, Ill., to Missouri River Crossings, Kansas City to Sioux City and Norfolk, Neb.

	Rates in cents per 100 lb.	
	Present (Class E)	Proposed
Kansas City, Mo.	24	13
St. Joseph, Mo., and other points shown under Index Nos. 1 to 18 of W. T. L. 1P	24	13
Nebraska City, Neb.	24	15½
Omaha, Neb.	24	15½
South Omaha, Neb.	24	15½
Council Bluffs, Iowa	24	15½
Sioux City, Iowa	24	16
Norfolk, Neb.	34	25½

Minimum weight, marked capacity of car.

39-2A. Stone or granite. Carloads, as described in Item 1945 W.T.L. Tariff 13N. From St. Cloud, Minn., to Carrollton, Milan, and Unionville, Mo. Present, 38½ cents (Class C); proposed, 27½ cents. Minimum weight 50,000 lb.

4990. Sand. Carloads, from La Grange, Mo., to Pulaski, Iowa. Present, 11½ cents per 100 lb.; proposed, $1.20 per net ton. Minimum weight 90% of marked capacity of car, except that when actual weight of shipment loaded to full visible capacity of car is less than 90% of marked capacity of car, the actual weight will be the minimum weight. In no case shall the minimum weight be less than 40,000 lb.

Lower Silica Sand Rates Recommended for Michigan Points

RECOMMENDATION of a 13-cent-per-ton reduction on silica sand rates between the cities of St. Joseph and Benton Harbor, Mich., to eastern points has been made by Examiner John McCord to the Michigan Interstate Commerce Commission, Gordon E. Riley, manager of the Twin-City Manufacturers' Traffic Bureau, announced recently.

Hearing on the claims, made in behalf of local shippers by Mr. Riley before the commission, was held in St. Joseph on June 15.

Mr. McCord, attorney for the commission, in a report of his findings to the Interstate Commerce Commission, stated that the present rate of $2.02 a ton from the Ottawa, Ill., district to St. Joseph and Benton Harbor was unduly prejudicial to local shippers in comparison with rates from the same district to South Bend, Michigan City, Niles, Elkhart, and Buchanan.

He recommends that the rate be cut to $1.89 a ton. This would bring a reduction of approximately $6.50 a carload.

Attorney McCord, however, recommends that the commission deny claims to reparation from charges made in the past under the present rates.

Mr. Riley said today he expected the commission to act on the report within a short time.—*Benton Harbor (Mich.) News.*

Kansas Points Get Lower Rates on Sand

REDUCTIONS of approximately one cent per 100 lb. on sand are allowed in rate orders issued recently by the Kansas Public Service Commission. The Santa Fe and M. K. & T. got permission to make a rate of 6½ cents per 100 lb. on sand from Topeka to Parsons. The M. K. & T. and Missouri Pacific also got through a rate of 6½ cents from Oxford to Chanute. Both reductions were obtained to meet competitive rates from other roads.—*Topeka (Kas.) Capital.*

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F.O.B., at producing point or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Carey, Ohio	.65@ .75	.90@1.10	.85@1.00	.80@ .90	.80@ .90	.80@ .90
Chaumont, N. Y.	.50		1.75	1.25	1.25	1.25
Chazy, N. Y.	.75	1.65	1.65	1.40	1.40	1.40
Cobleskill, N. Y.	1.50	1.35	1.25	1.25		
Eastern Pennsylvania	1.35	1.35	1.35	1.35	1.35	1.35
Frederick, Md.	.50	.75	1.30	1.20	1.10	1.10
Munns, N. Y.	1.00	1.50	1.50	1.40	1.40	
Northern New Jersey	1.60	1.50@1.80	1.30@2.00	1.40@1.60	1.40@1.60	
Walford, Penn.	1.00	1.30		1.50h	1.50h	
Watertown, N. Y.	.50		1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Afton, Mich.					.50	
Alton, Ill.	1.75		1.75			
Bloomville, Middlepoint, Dunkirk Bellevue, Waterville, No. Baltimore, Holland, Kenton, New Paris, Ohio; Monroe, Mich.; Huntington, Bluffton, Ind.	1.00	1.10	1.10	1.00	1.00	1.00
Buffalo, Iowa	1.20		1.35	1.15	1.20	1.20
Chasco, Ill.		1.15	1.15	1.15	1.15	
Columbia, Krause, Valmeyer, Ill.	1.00@1.50	1.20@1.25	1.20@1.25	1.20	1.20	1.50
			Flux all at 1.30			
Cypress, Ill.	1.15	1.15	1.15	1.15	1.05	1.00
Gary, Ill.	1.00	1.37½	1.37½	1.37½	1.37½	1.37½
Greencastle, Ind.	1.25	1.15	1.15	1.05	.95	.95
Lannon, Wis.	.80	1.00	1.00	.90	.90	.90
Milltown, Ind.		.85@1.00	.75@ .90	.85@1.00	.85@ .90	.85@ .90
Northern New Jersey	1.30		1.80	1.60	1.40	
River Rouge, Mich.	1.10	1.10	1.10	1.10	1.10	1.10
Sheboygan, Wis.	1.10	1.10	1.10	1.10	1.10	1.10
St. Vincent de Paul, Que.	.85	1.35	1.05	.95	.90	.90
Stone City, Iowa	.75		1.10	1.05	1.00	
Waukesha, Wis.	.90	.90	.90	.90	.90	.90
SOUTHERN:						
Allgood, Ala.			Crusher run, fines out, for flux, 1.00 per net ton			
Cartersville, Ga.	1.65	1.65	1.65	1.15	1.15	1.15
Chico, Texas	.90	1.35	1.35	1.25	1.20	1.10
El Paso, Texas	1.00	1.10	1.00	1.00		
Ft. Springs, W. Va.	.50	1.60	1.50	1.35	1.25	
Graystone, Ala.			Crusher run fluxing stone, 1.00 per net ton			
Henderson, N. C.			1.50		1.25	
New Braunfels, Texas	.50@ .60	1.00@1.20	1.00@1.20	.80@1.00	.75@ .90	.75@ .90
Olive Hill, Ky.	.50@1.00‡	1.00	1.00	1.00	1.00	1.00
Rockwood, Ala.	.90				1.00	.90
Rocky Point, Va.	.50@1.00	1.40@1.60	1.30@1.40	1.15@1.35	1.10@1.20	1.00@1.05
WESTERN:						
Atkinson, Kans.	.25	2.00	2.00	2.00	2.00	1.60‖@1.80
Blue Springs & Wymore, Neb.	.25	1.45	1.45	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25		1.25	1.25	1.00	
Kirkfield, Ontario	.70	1.05	.90	.90	.90	.90
Rock Hill, St. Louis Co., Mo.	1.25	1.25	1.25	1.25	1.25	1.35

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.70	1.45	1.20	1.05	
Duluth, Minn.	.90	2.25	1.90	1.50	1.35	1.35
Dwight, Calif.	1.00	1.00	1.00	.90	.90	
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
Knippa, Texas	2.50	2.00	1.55	1.40@1.50	1.25	
New Haven, New Britain, Meriden & Wallingford, Conn.	.60	1.70	1.45	1.20	1.05	1.05
Northern New Jersey	1.80	2.00	1.80	1.40	1.40	
Oakland and El Cerritto, Cal.	1.00	1.00	1.00	.90	.90	
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	
Springfield, N. J.	1.70e	2.00	2.10	1.70	1.70	

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley, Montello and Red Granite, Wis.—Granite	1.80	1.70	1.50		1.40	
Coldwater, N. Y.—Dolomite			1.50 all sizes			
Columbia, S. C.—Granite	.50	1.75	1.75		1.60	
Eastern Penn.—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Havelock, Ontario		2.60	2.10	2.10		
Lithonia, Ga. (granite)	.75a@1.75	1.60		1.35	1.35	
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	
Middlebrook, Mo.—Granite	3.00@3.50		2.00@2.25	2.00@2.25		1.25@2.00
Northern New Jersey (Basalt)	1.50	2.00	1.80	1.40	1.40	
Richmond, Calif.—Quartzite	.75*		1.50*	1.50*	1.50*	
Toccoa, Ga. (granite)	.50		1.35@1.50	1.25@1.50	1.25@1.35	

*Cubic yd. †1 in. and less. ‡Two grades. ‖Rip rap per ton. (a) Sand. (b) to ¼ in. (c) 1 in., 1.40. (d) 2 in., 1.30. (e) Dust. (f) ¼ in. (h) less 10c discount. (i) 1 in., 1.40.

Agricultural Limestone

(Pulverized)

Alton, Ill.—Analysis 99% $CaCO_3$, 0.3% $MgCO_3$; 90% thru 100 mesh	6.00
Asheville, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Belfast and Rockland, Me. (rail), Lincolnville, Me. (water), analysis $CaCO_3$ 90.04%; $MgCO_3$ 1.5%, 100% thru 14 mesh, bags	4.50
Bulk	3.00
Branchton and Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; pulverized; 50% thru 50 mesh	1.50
Cartersville, Ga.—Analysis 68% $CaCO_3$, 32% $MgCO_3$; pulverized	2.50
50% thru 50 mesh	2.00
Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk	2.50
Chico, Tex.—⅛ in. down	1.50
200 mesh	10.00
Colton, Calif.—Analysis 90% $CaCO_3$, bulk	4.00
Cypress, Ill.—90% thru 100 mesh	1.35
Danbury, Conn., Rockdale and West Stockbridge, Mass.—Analysis, 90% $CaCO_3$, 5% $MgCO_3$; 50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk	3.25
Henderson, N. C. (paving dust)—80% thru 200 mesh, bags	4.25@ 4.75
Bulk	3.00@ 3.50
Analysis $CaCO_3$, 56%; $MgCO_3$, 42%; 65% thru 200 mesh, bags	3.95
Bulk	2.70
Hillsville, Penn.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$; 75% thru 100 mesh; sacked	5.00
Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk	2.50
Knoxville, Tenn.—Analysis, 52% $CaCO_3$, 37% $MgCO_3$; 80% thru 100 mesh; bags, 3.95; bulk	2.70
80% thru 200 mesh, bulk	3.50
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.10; bulk	3.60
Marion, Va.—Analysis, 90% $CaCO_3$, pulverized, per ton	2.00
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 90% thru 100 mesh	3.90@ 4.50
Milltown, Ind.—Analysis, 94.50% $CaCO_3$, 33% thru 50 mesh, 40% thru 50 mesh; bulk	1.35@ 1.60
Olive Hill, Ky.—Bulk	2.00
Piqua, Ohio—Total neutralizing power 95.3%; 99% thru 10, 60% thru 50; 50% thru 100	2.50@ 2.75
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.10; bulk	3.60
99% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Rocky Point, Va.—Analysis 99.5% $CaCO_3$, 0.25% $MgCO_3$; 50% thru 200 mesh; bags, 3.25@3.50; bulk	2.00@ 2.25
Waukesha, Wis.—90% thru 100 mesh	4.50
Watertown, N. Y.—Analysis, 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50

Agricultural Limestone

(Crushed)

Alton, Ill.—Analysis 99% $CaCO_3$, 0.3% $MgCO_3$; 50% thru 4 mesh	3.00
Atlas, Ky.—Analysis over 90% $CaCO_3$; 90% thru 4 mesh	1.00@ 2.00
Bedford, Ind.—Analysis, 98.5% $CaCO_3$, 0.5% $MgCO_3$; 90% thru 10 mesh	1.50
Bettendorf, Iowa—97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Blackwater, Mo.—Analysis, 99% $CaCO_3$; 90% thru 4 mesh	.60
(Continued from preceding page)	
Bridgeport and Chico, Texas—Analysis, 94% $CaCO_3$, 2% $MgCO_3$; 100% thru 10 mesh	1.75
50% thru 4 mesh	1.50
Chasco, Ill.—50% thru 100 mesh	1.20
Chico, Texas—90% thru 4 mesh; bulk	1.50

(Continued on next page)

Agricultural Limestone

Chicago, Ill.—50% thru 100 mesh; 90% thru 4 mesh ..... .80
Columbia, Krause, Valmeyer, Ill.—Analysis, 90% $CaCO_3$; 90% thru 4 mesh 1.35
Cypress, Ill.—90% thru 50 mesh, 50% thru 100 mesh, 90% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh 1.35
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh..... 1.50
Garnet, Okla.—All sizes..... 1.25
Gary, Ill.—Analysis, approx. 60% $CaCO_3$, 40% $MgCO_3$; 90% thru 4 mesh ..... .75
Kansas City, Mo.—50% thru 100 mesh 1.25
Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh..... 2.00
Screenings (¼ in. to dust)..... 1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$, 32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk 1.60
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 50% thru 50 mesh.... 1.85@ 2.35
Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind.—Analysis, 42% $CaCO_3$, 54% $MgCO_3$; meal, 25 to 45% thru 100 mesh..... 1.60
Milltown, Ind. — Analysis $CaCO_3$, 93.10%, 40% thru 50 mesh..... 1.35@ 1.60
Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh 1.50
Pixley, Mo.—Analysis, 96% $CaCO_3$; 50% thru 50 mesh..... 1.25
50% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh..... 1.65
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk..... .80@ 1.40
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh..... .75
Tulsa, Okla.—Analysis $CaCO_3$, 86.15%, 1.25% $MgCO_3$, all sizes..... 1.25
Waukesha, Wis.—100% thru 10 mesh; bags, 2.85; bulk..... 2.10

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk..... 3.00
Piqua, Ohio, sacks, 4.50@5.00 bulk.... 3.00@ 3.50
Rocky Point, Va.—80% thru 200 mesh; bags ..... 4.25@ 4.75
Waukesha, Wis.—90% thru 100 mesh, bulk 3.70

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

Glass Sand

Berkeley Springs, W. Va.—Glass sand.. 2.25
Cedarville and S. Vineland, N. J.—
Damp 1.75
Dry 2.25
Cheshire, Mass.:
6.00 to 7.00 per ton; bbl..... 2.50
Columbus, Ohio ..... 1.25@ 1.50
Estill Springs and Sewanee, Tenn..... 1.50
Franklin, Penn. 2.25
Gray Summit and Klondike, Mo..... 2.00
Los Angeles, Calif.—Washed..... 5.00
Mapleton Depot, Penn..... 2.00@ 2.25
Massillon, Ohio 3.00
Mineral Ridge and Ohlton, Ohio..... 2.50
Oceanside, Calif. 3.00
Ottawa, Ill.—Chemical and mesh guaranteed 1.25
Pittsburgh, Penn.—Dry 4.00
Damp 3.00
Red Wing, Minn.:
Bank run 1.50
Ridgway, Penn. ..... 2.00@ 2.25
Rockwood, Mich. ..... 2.75@ 3.25
Round Top, Md. 2.25
San Francisco, Calif. ..... 4.00@ 5.00
St. Louis, Mo. 2.00
Sewanee, Tenn. 1.50
Thayers, Penn. 2.50
Utica, Ill. ..... 1.00@ 1.15
Zanesville, Ohio 2.50
Core and Foundry Sand:
Aetna, Ind.:
Core, Box cars, net, .35; open-top cars ..... .30
Albany, N. Y.:
Molding coarse 2.00
Brass molding 1.75
Sand blast 4.50
Molding fine 2.75

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F.O.B., producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge & So. H'g'ts, Penn.	1.25	1.25	1.15	.85	.85	.85
Attica and Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95			.85	
Erie, Pa.		1.00*		1.50*	1.75*	
Farmingdale, N. J.	.58	.48	.75	1.25	1.10	
Hartford, Conn.	.65*					
Leeds Junction, Me.		.50	1.75		1.35	1.25
Machias Jct., N. Y.		.75	.75		.75	.75
Montoursville, Pa.	1.00@1.25	1.10@1.25	1.00	.90	.90	.75
Northern New Jersey	.50	.50	1.25	1.25	1.25	
Olean, N. Y.		.75	.75	.75	.75	.75
Shining Point, Penn.			1.00	1.00	1.00	1.00
South Heights, Penn.	1.25	1.25	.85	.85	.85	.85
Washington, D. C.	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Algonquin and Beloit, Wis.	.50	.40	.60	.60	.60	.60
Attica, Ind.	.75	.75	.75	.75	.75	.75
Barton, Wis.		.50		.75		.75
Boston, Mass.‡	1.60	1.60	2.50	2.50	2.50	2.50
Chicago, Ill.	.70	.50	.50	.60	.60	.60
Columbus, Ohio		.70	.70	.70	.70	
Des Moines, Iowa	.40	.40	1.20	1.50	1.50	1.50
Eau Claire, Wis.	.85@1.25	.40@ .50	.80@1.25	.95@1.05		.85@ .95
Elgin, Ill.		.20*	.50*	1.50*	1.50*	1.50*
Elkhart Lake, Wis.	.60	.40	.50	.50	.50	.50
Ferrysburg, Mich.		.50@ .80	.60@1.00	.60@1.00		.50@1.25
Ft. Dodge, Iowa	.85	.85	2.05	2.05	2.05	2.05
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Grand Haven, Mich.		.40@ .80		.60@1.00		
Grand Rapids, Mich.	.50	.50	.90	.80	.80	.70
Hamilton, Ohio		1.00			1.00	
Hersey, Mich.	.50	.50		.80	.70	.70
Humboldt, Iowa		.85	2.00	2.00	2.00	
Indianapolis, Ind.	.60	.60		.90	.75@1.00	.75@1.00
Mason City, Iowa	.45@ .55	.45@ .55	1.35@1.45	1.45@1.55	1.40@1.50	1.35@1.45
Mankato, Minn.		.50	1.35	.60e	1.35	1.35
Mattoon, Ill.	.75	.75	.75	.75	.75	.75
Milwaukee, Wis.		1.01	1.21	1.21	1.21	1.21
Moline, Ill.	.60@ .85	.60@ .85	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Northern New Jersey	.50	.50	1.25	1.25	1.25	
Oregon City, Ore.		1.25	1.25	1.25	1.25	1.25
Palestine, Ill.	.75	.75	.75	.75	.75	.75
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
St. Louis, Mo.	1.18	1.45	1.65	1.45	1.65	1.45c
Terre Haute, Ind.	.75	.60	.75	.85	.75	.75
Wolcottville, Ind.	.75	.75	.75	.75	.75	.75
Waukesha, Wis.		.45	.60	.60	.65	.65
Winona, Minn.	.40	.40	1.50	1.25	1.10	1.00
Yorkville, Sheridan, Oregon, Moronts, Ill.		.40@ .70	.30@ .50	.50@ .60	.60	.60
Zanesville, Ohio	.70	.60	.60	.60	.80	
SOUTHERN:						
Charleston, W. Va.		All sand, 1.40.		All gravel, 1.50.		
Chattanooga, Tenn.		1.45			1.20	1.20
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.00
Lindsay, Texas					.55	
Macon, Ga.	.50	.50	3.50*	3.50*	3.50*	3.50*
New Martinsville, W. Va.	1.00	.80@ .90	1.20@1.30			.80@ .90
Roseland, La.	.50	.50	1.50	1.00	1.00	1.00
WESTERN:						
Baldwin Park, Calif.	.20	.20	.40	.50	.50	
Kansas City, Mo.	.80	.70				
Los Angeles, Calif. (d)	.50	.40	.40	.75	.75	.75
Los Angeles district (bunkers)†	1.50	1.40	1.85	1.85	1.85	1.85
Phoenix, Ariz.	1.25*	1.00*	2.50*	2.00*@2.25*	1.75*	1.50*
Pueblo, Colo.	1.10*	.90*		1.60*		1.50*
San Diego, Calif.		.60	1.25	1.20	1.00	1.00
Seattle, Wash. (bunkers)	1.50*	1.50*	1.50*	1.50*	1.50*	1.50*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.			Dust to 3 in., .40			
Boonville, N. Y.	.60@ .80		.55@ .75			1.00
Chicago, Ill.	.95					
Des Moines, Iowa	.50					
Dudley, Ky. (crushed silica)	1.10	1.10		.90		
East Hartford, Conn.			Sand, .75*			
Elkhart Lake, Wis.	.50					
Ferrysburg, Mich.						.65@1.00
Gainesville, Texas		.95				.55
Grand Rapids, Mich.	.50	.50		.60		
Hamilton, Ohio					.70	
Hersey, Mich.				.50		
Indianapolis, Ind.			Mixed gravel for concrete work, at .65			
Lindsay, Texas	1.30					.55
Macon, Ga.		.35				
Mankato, Minn.			Pit run sand, .50			
Moline, Ill. (b)	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Ottawa, Oregon, Moronto and Yorkville, Ill.			Ave. .60 per ton all sizes			
St. Louis, Mo.			Mine run gravel, 1.55 per ton			
Shining Point, Penn.			Concrete sand, 1.10 ton			
Smithville, Texas	.50	.50	.50	.50	.50	.50
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.	.60	.60	.60	.60	.60	.60
York, Penn.	1.10	1.00				

(a) ¾ in. down. (b) River run. (c) 2½ in. and less.
*Cubic yd. †Include freight and bunkerage charges and truck haul. ‡Delivered on job.
(d) Less 10c per ton if paid E.O.M. 10 days. (e) pit run.

Miscellaneous Sands

(Continued from preceding page)

Arenzville, Ill.:
- Core 1.00
- Molding fine 1.50@ 1.75

Beach City, Ohio:
- Core 1.75
- **Stone, sawing, coarse 1.75**
- **Molding, fine and coarse, washed 1.75@ 2.25**
- Traction 1.50@ 2.00
- **Furnace lining 2.00@ 2.50**

Cheshire, Mass.:
- Glass sand, 24 and 40 mesh, bulk 5.00

Columbus, Ohio:
- Core .20@ .30
- Furnace lining 2.50
- Molding fine 2.00@ 2.50
- Molding coarse 1.50@ 2.50
- Sand blast 3.50@ 4.50
- Stone sawing 1.50@ 2.00
- Traction .30@ .90
- Brass molding 2.00@ 3.00

Eau Claire, Wis.:
- Sand blast 3.00@ 3.25
- **Core 1.00**
- **Roofing sand 4.25**

Elco, Ill.:
- Ground silica per ton in carloads 18.00@31.00

Elnora, N. Y.:
- Brass molding 1.75

Estill Springs and Sewanee, Tenn.:
- Molding fine and core 1.25
- Roofing sand, sand blast, traction 1.35@ 1.50

Franklin, Penn.:
- Molding fine and coarse and core 1.75

Gray Summit and Klondike, Mo.:
- Core, roofing and brass molding 2.00
- Molding fine and coarse, traction 1.75
- Furnace lining 1.00
- Stone sawing .85@ 1.00

Joliet, Ill.:
- No. 2 molding sand; also loam for luting purposes and open-hearth work .65@ .85

Kasota, Minn.:
- **Stone sawing 1.00**

Mapleton Depot, Penn.:
- Glass sand 2.00@ 2.25
- Molding fine, coarse and traction 2.00

Massillon, Ohio:
- Core, molding fine and coarse (green), 1.75; dry 2.25
- Furnace lining 2.50

Michigan City, Ind.:
- **Core and Traction .15@ .30**

Mineral Ridge and Ohlton, Ohio:
- Furnace lining, molding coarse, sand blast, traction (damp) 1.75
- Roofing sand (damp) 1.75@ 2.00
- Core, molding fine (damp) 2.00
- Glass sand (dry) 2.50

Montoursville, Penn.:
- Traction 1.10@ 1.25
- Core 1.25@ 1.50

New Lexington, Ohio:
- Molding fine 2.00
- Molding coarse 1.50

Oceanside, Calif.:
- Roofing sand **3.50**

Ottawa, Ill.:
- Molding coarse (crude silica, not washed or dried) **.75@ 1.00**

Red Wing, Minn.:
- Core, furnace lining, stone sawing 1.50
- Molding fine and coarse, traction 1.25
- Sand blast 3.50
- Filter sand 3.75

Crushed Slag

City or shipping point	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in and less	2½ in. and less	3 in. and larger
EASTERN:							
Buffalo, N. Y., Emporium nd Dubois, Pa.	2.25	1.25	1.25	1.25	1.25	1.25	1.25
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Reading, Pa.	2.50	1.00	.....	1.25	.....	.....	.....
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	.....	1.45	1.80@1.85	1.45	.....	1.45	1.45
Jackson, Ohio	.....	1.05	.....	1.30@1.35	1.05	.....	1.30@1.35
Toledo, Ohio	1.50	1.25	1.25	1.25	1.25	1.25	1.25
Youngst'n, O., dist.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.	.....	1.55	.....	1.55	1.55	1.55	1.55
Ensley and Alabama City, Ala.	2.05	.80	1.35	1.25	.90	.90	.80
Longdale, Roanoke, Ruessens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
EASTERN:								
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.20
Buffalo, N. Y.	.....	12.00	12.00	12.00	.....	.....	.....	2.00
Chazy, N. Y.	12.50	9.50	9.00	13.50	11.50	16.50	10.50	2.90
Lime Ridge, Penn.	.....	.....	.....	.....	.....	.....	5.00a	.....
West Stockbridge, Mass. (f)	13.00	10@11.00	5.00	.....	.....	.....	.....	2.25t
Williamsport, Penn.	.....	.....	10.00	.....	.....	.....	6.00	.....
York, Penn.	.....	10.50	10.50	11.50	9.00	10.50	8.50	1.65i
CENTRAL:								
Afton, Mich.	.....	.....	.....	.....	.....	.....	8.75	1.65u
Carey, Ohio	12.50	8.50@9.50	9.50	.....	9.50	.....	9.00	.....
Cold Springs, Ohio (f)	12.50	10.00	9.00	.....	9.00	11.00	9.00	.....
Delaware, Ohio	12.50	10.00	9.00	10.00	.....	.....	9.00	1.50
Frederick, Md.	.....	10.00	9.50	10.00	.....	.....	7.50	1.45
Gibsonburg, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	1.50c
Huntington, Ind.	12.50	8.50	8.00	.....	.....	.....	.....	.....
Luckey, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	.....
Marblehead, Ohio	.....	8.50	8.00	.....	.....	.....	9.00	1.50c
Marion, Ohio	.....	8.50	8.00	.....	.....	.....	.....	.....
Milltown, Ind.	.....	.....	10.00‡	11.00@12.00	.....	.....	8.50‖	1.40w
Sheboygan, Wis.	.....	.....	.....	.....	.....	.....	9.50	.....
Tiffin, Ohio	.....	.....	.....	.....	9.00	.....	.....	.....
White Rock, Ohio	12.50	.....	.....	.....	9.00	11.00	.....	.....
Wisconsin (Brillion, Clifton, Grimms, Green Bay, Hamilliton, Hayton, Knowles, Nasbro, Quarry) (f)	.....	11.50	.....	.....	.....	.....	9.50	.....
Woodville, Ohio	12.50	8.00	9.00	.....	9.00	10.00	9.00	1.50
SOUTHERN:								
Allgood and Saginaw, Ala.	12.50	10.00	.....	10.00	.....	1.35u	8.50	1.50
El Paso, Tex.	.....	.....	.....	.....	.....	.....	14.00	1.75
Graystone, Landmark and Wilmay, Ala.	12.50	10.00	.....	.....	.....	.....	8.50	1.50
Keystone, Ala.	12.00	10.00	10.00	10.00	9.00	.....	8.50	1.50u
Knoxville, Tenn.	20.50	10.00	10.00	10.00	.....	.....	8.50	1.50
Ocala, Fla.	13.00	.....	13.00	.....	.....	1.60	12.00	1.70
WESTERN:								
Calcite, Colo.	.....	.....	.....	.....	.....	.....	9.00‡	.....
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	15.00	.....
New Braunfels, Texas	12.00	12.00	10.00	12.00	.....	.....	9.50	1.50
San Francisco, Calif.	21.00	21.00	12.50@15.00	21.00	.....	.....	14.50	1.90v
Tehachapi, Calif.	.....	.....	8.00	.....	.....	.....	13.00z	2.20x
Seattle, Wash.	19.00	19.00	12.00	19.00	19.00	.....	18.60	2.30

†50-lb. paper bags; (a) run of kilns; (c) wooden, steel 1.70; (d) wood; (e) per 180-lb. barrel; (f) dealers' prices; (g) to 9.50; (h) to 1.75; (i) 180-lb. net barrel 1.65; 280-lb. net barrel, 2.65 (m) finishing lime, 3.00 common; (n) common lime; (o) high calcium; (p) to 11.00; (q) to 8.50; (r) to 1.50; (s) in 80-lb. burlap sacks; (t) common, 2.50 plastering; 3.00 finishing; (u) two 90-lb. bags; (v) oil burnt; wood burnt 2.25@2.50; (x) wood, steel 2.30; (z) to 15.00; (*) quoted f.o.b. New York; (‡) paper bags; (w) to 1.50 in two 90-lb. bags, wood bbl. 1.50@1.60; (‖) to 10.00.

Miscellaneous Sands

(Continued)

Ridgeway, Pa.:
- Molding fine and coarse 1.50
- Core 2.00

Round Top, Md.:
- Core 1.60
- Glass sand 2.25
- Traction 1.75
- Sand blast 2.25
- Roofing sand 2.25

San Francisco, Calif.:
- Core and sand blast (washed and dried) 3.50@ 5.00
- Core (pit and drained) 2.50@ 4.00
- Roofing sand, furnace lining, traction (washed and dried) 3.50@ 4.50
- Molding fine; pit, 2.50; drained, 2.75; washed and dried 3.50
- Molding coarse; pit, 3.75; drained, 4.00; washed and dried 4.75
- Brass molding (washed and dried) 3.50

Sewanee, Tenn.:
- Molding fine and coarse, roofing sand, sand blast, stone sawing, traction, brass molding 1.25

Tamalco, Ill.:
- Molding coarse 1.50@ 1.75

Tamms, Ill.:
- Ground silica per ton in carloads 20.00@31.00

Thayers, Penn.:
- Core 2.00
- Molding fine and coarse 1.25
- Traction 2.25

Utica, Ill.:
- Core, furnace lining and molding, coarse .80
- Molding fine .75

Utica, Penn.:
- Core 2.00
- Molding fine and coarse 1.75

Warwick, Ohio:
- Core, molding fine and coarse (green) 1.75
- Core, molding fine (dry) 2.25

Zanesville, Ohio:
- Molding fine 1.75@ 2.00
- Molding coarse 1.50@ 1.75
- Brass molding 1.50

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:
- Crude talc (mine run) 3.00@ 4.00
- Ground talc (20-50 mesh), bags 10.00
- Cubes 55.00
- Blanks (per lb.) .08
- Pencils and steel worker's crayons, per gross .08 1.25

Chatsworth, Ga.:
- Crude talc 5.00
- Ground talc (150-200 mesh) bags 9.00@12.00
- Pencils and steel worker's crayons, per gross 1.50

Chester, Vt.:
- Ground (150-200 mesh), bulk 8.00@ 9.00
- Including bags 10.00@11.00

Chicago and Joliet, Ill.:
- Ground (150-200 mesh), bags 30.00

Dalton, Ga.:
- Crude talc 5.00
- Ground talc (150-200) bags 10.00
- Pencils and steel workers' crayons, per gross 1.00@ 2.50

Emeryville, N. Y.:
- (Double air floated) including bags;
- 325 mesh 14.75
- 200 mesh 13.75

Hailesboro, N. Y.:
- Ground white talc (double and triple air floated) including bags, 350 mesh 15.50@20.00

Henry, Va.:
- Crude (mine run) 3.50@ 4.50
- **Ground talc (150-200 mesh), bags 9.75@15.00**

Joliet, Ill.:
- Ground talc (150-200) bags 12.00@30.00

Keeler, Calif.:
- Ground (200-300 mesh), bags 20.00@30.00

Natural Bridge, N. Y.:
- Ground talc (300-325 mesh), bags 13.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

- **Gordonsburg, Tenn.—B.P.L. 68-72% 4.50@ 5.00**
- Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L. 5.00
- Twomey, Tenn.—B.P.L. 65%, 2000 lb. 7.00@ 8.00

Ground Rock

(2000 lbs.)

- Centerville, Tenn.—B.P.L. 65% 7.00
- Gordonsburg, Tenn.—B.P.L. 65-72% 4.00@ 5.00
- Mt. Pleasant, Tenn.—B.P.L. 65%; bulk 7.00
- Twomey, Tenn.—B.P.L. 65% 7.00@ 8.00

(Continued on next page)

(Continued from preceding page)

Florida Phosphate
(Raw Land Pebble)
(Per Ton.)

Florida—F. O. B. mines, gross ton, 68/66% B.P.L., Basis 68%.....	3.00
70% min. B.P.L., Basis 70%.....	3.55
72% min. B.P.L., Basis 72%.....	4.10
75/74% B.P.L., Basis 75%.....	4.85
77/76% B.P.L., Basis 77%.....	5.60

Fluorspar

Fluorspar, 85% and over calcium fluoride, not over 5% silica, per net ton, f.o.b. Illinois and Kentucky mines	16.00
No. 2 lump, per net ton.....	19.00
Fluorspar, foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Philadelphia, duty paid, per net ton..	16.00
Fluorspar, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, per net ton, f.o.b. Illinois and Kentucky mines.....	32.50

Special Aggregates

Prices are per ton f.o.b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco-chips
Barton, Wis., f.o.b. cars	.....	10.50
Brandon, Vt.—English pink and English cream	*11.00	*11.00
Buckingham, Que.—Buff stucco dash.....		‡12.00@14.00
Chicago, Ill. — Stucco chips, in sacks f.o.b. quarries	.....	17.50
Crown Point, N. Y.—Mica Spar	.....	8.00@10.00
Easton, Pa., and Phillipsburg, N. J.—Green grits or facings		1.50@ 3.00
Haddam, Conn. — Felstone buff	15.00	15.00
Harrisonburg, Va.—Blk marble (crushed, in bags)	†12.50	†12.50
Ingomar, Ohio	.....	‡8.00
Middlebrook, Mo.—Red	.....	20.00@25.00
Middlebury and Brandon, Vt.—Middlebury white‡	7.00@11.00	7.00@11.00
Milwaukee, Wis.....	.....	14.00@34.00
Newark, N. J.—Roofing granules	.....	7.50
New York, N. Y.—Red and yellow Verona....	.....	32.00
Red Granite, Wis.....	.....	7.50
Sioux Falls, S. D.....	7.50	7.50
Stockton, Calif. — "Natrock" roofing grits		14.00
Tuckahoe, N. Y.....	.....	12.00
Villa Grove, Colo.....	.....	13.00
Wauwatosa, Wis.....	.....	16.00@45.00
Wellsville, Colo.—Colorado Travertine Stone	15.00	15.00

†C.L. Less than C.L., 15.50.
*C.L. including bags; L.C.L. 14.50.
‡C.L. including bags.

Potash Feldspar
(Pulverized)

Auburn and Brunswick, Me.—Color, white; 98% thru 140 mesh bulk.....	19.00
Bath, Me.—Color, white; analysis, potash, 12%; 100% thru 180 mesh, bags, 21.00; bulk.....	18.00
Buckingham, Que.—Color, white; analysis, K_2O, 12-13%; Na_2O, 1.75%; bulk	9.00
De Kalb Jct., N. Y.—Color, white; bulk	8.00
East Hartford, Conn.—Color, white (60-80 mesh); bags.....	17.00@20.00
Finer grades	20.00@30.00
Erwin, Tenn.—Color, white; analysis, 12.07% K_2O, 19.34% Al_2O_3; Na_2O, 2.92%; SiO_2, 64.76%; Fe_2O_3, .36%; 98.50% thru 200 mesh, bags, 16.90; bulk	15.50
Los Angeles, Calif.—Color, white; analysis, K_2O, 10.35%; Na_2O, 3.62%; Al_2O_3, 18.71%; SiO_2, 65.48%; Fe_2O_3, .17%; 100% thru 150 mesh, bags, 24.00; bulk.....	22.00
Murphsboro, Ill.—Color, prime white; analysis K_2O, 12%; Na_2O, 2%; 65% SiO_2; crude, bags, 13.00; bulk	18.00
100% thru 200 mesh; bags, 22.00; bulk	21.00
100% thru 100 mesh; bags, 20.00; bulk	19.00
Penland, N. C.—Color, white; crude, bulk	8.00
Ground, bulk	16.50
Tenn. Mills—Color, white; analysis K_2O, 18%; Na_2O_3, 10%; 68% SiO_2; 99% thru 200 mesh; bulk.....	18.00
99% thru 140 mesh, bulk.....	16.00
Trenton, N. J.—Crude, bulk.....	12.00@27.00
99% thru 140 mesh; bulk.....	16.00
(Bags 11 cents each, non-returnable)	
Wheeling, W. Va.—Color, white; analysis,, K_2O, 9.50%; Al_2O_3, 16.70%; Na_2O, 3.50%; SiO_2, 69.50%; 99% thru 140 mesh, bulk.....	19.00
Glen Tay, Ontario, Can.—Color, flesh red to pink; analysis, K_2O, 12.81%; Fe_2O_3, .11%, etc., crude, bulk.....	7.00@ 7.50

Blended Feldspar
(Pulverized)

Tenn. Mills—Bulk.....	16.00@20.00
Toughkenamon, Pa.—Color, white to light cream; 98% thru 125-150 mesh, bags, 12.00@13.00; bulk.....	10.00

Chicken Grits

Belfast and Rockland, Me.—(Limestone), bulk, per ton.....	11.00
Los Angeles Harbor (limestone), 100-lb. sack, 1.00; sacks, per ton, 8.50@9.50†; bulk, per ton.....	6.00@7.00†
Toughkenamon, Pa.—(Feldspar) 100-lb. bags, 1.00; bulk, per ton.....	10.00
Danbury, Conn., Rockdale and West Stockbridge, Mass. — (Limestone) bulk	7.50@9.00*
Seattle, Wash.—(Limestone), bulk, per ton	12.50

*L.C.L.
†Less than 5-ton lots.

Sand-Lime Brick

Prices given per 1000 brick f.o.b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass	14.50
Brighton, N. Y.....	*19.75
Dayton, Ohio	12.50@13.50
Detroit, Mich.	‡14.00
Farmington, Conn.	18.00
Flint, Mich.	16.00@19.00
Grand Rapids, Mich.....	12.00
Hartford, Conn.	18.00
Jackson, Mich.	13.00
Lancaster, N. Y.....	13.50
Madison, Wis.	12.00
Michigan City, Ind.....	12.00
Milwaukee, Wis.	13.00
New Brighton, Minn.....	10.00
Pontiac, Mich.	13.00
Portage, Wis.	15.00
Rochester, N. Y. (del. on job).....	19.75
Saginaw, Mich.	13.00
San Antonio, Texas.....	13.00@13.50
Sebewaing, Mich.	12.00
Syracuse, N. Y.....	18.00
Terra Cotta, D. C.....	13.50
Toronto, Canada	12.00
Wilkinson, Fla.-White	12.00
Buff	16.00

*Delivered on job. †Delivered in city limits.
‡Less 5%.

Portland Cement

Prices per bag and per bbl, without bags net in carload lots.

	Per Bag	Per Bbl.
Albuquerque, N. M.....	.....	3.47
Atlanta, Ga.	.....	2.35
Baltimore, Md.	.....	2.35
Birmingham, Ala.	.....	2.30
Boston, Mass.	.....	2.63
Buffalo, N. Y.....	.....	2.38
Butte, Mont.	.90¼	3.61
Cedar Rapids, Iowa.....	.....	2.34
Charleston, S. C.....	.....	2.35
Cheyenne, Wyo.	.82¼	3.31
Cincinnati, Ohio	.....	2.37
Cleveland, Ohio	.....	2.29
Chicago, Ill.	.....	2.10
Columbus, Ohio	.....	2.34
Dallas, Texas	.48¾	2.15
Davenport, Iowa	.....	2.29
Dayton, Ohio	.....	2.38
Denver, Colo.	.81¼	3.25
Detroit, Mich.	.....	2.15
Duluth, Minn.	.....	2.09
Houston, Texas	.....	2.60
Indianapolis, Ind.	.....	2.29
Jackson, Miss.	.....	2.60
Jacksonville, Fla.	.....	2.50
Jersey City, N. J.....	.....	2.33
Kansas City, Mo.....	.....	2.33
Los Angeles, Calif.....	.63	2.52
Louisville, Ky.	.....	2.27
Memphis, Tenn.	.65	2.80
Milwaukee, Wis.	.....	2.25
Minneapolis, Minn.	.....	2.32
Montreal, Que.	.....	1.90
New Orleans, La.....	.....	2.40
New York, N. Y.....	.....	2.25
Norfolk, Va.	.....	2.35
Oklahoma City, Okla.....	.....	2.56
Omaha, Neb.	.....	2.51
Peoria, Ill.	.....	2.27
Philadelphia, Penn.	.....	2.41
Phoenix, Ariz.	.....	3.70
Pittsburgh, Penn.	.....	2.09
Portland, Colo.	.72½	2.90
Portland, Ore.	.....	2.60
Reno, Nevada	.75¼	3.01
Richmond, Va.	.....	2.47
Salt Lake City, Utah.....	.70¼	2.81
San Francisco, Calif.....	.....	2.31
Savannah, Ga.	.....	2.50
St. Louis, Mo.....	.57½	2.20
St. Paul, Minn.....	.....	2.32
Seattle, Wash.	10c discount	2.65
Tampa, Fla.	.....	2.60
Toledo, Ohio	.....	2.20
Topeka, Kans.	.....	2.40
Tulsa, Okla.	.....	2.43
Wheeling, W. Va.....	.....	2.17
Winston-Salem, N. C.....	.....	2.79

NOTE—Add 40c per bbl. for bags.

Mill prices f.o.b. in carload lots, without bags, to contractors.

	Per Bag	Per Bbl.
Buffington, Ind.	.....	1.95
Chattanooga, Tenn.	.....	2.45*
Concrete, Wash.	.....	2.35
Davenport, Calif.	.....	2.05
Detroit, Mich.	.....	2.15
Hannibal, Mo.	.....	2.05
Hudson, N. Y.....	.....	2.05
Leeds, Ala.	.....	1.95
Mildred, Kans.	.....	2.35
Nazareth, Penn.	.....	1.95
Northampton, Penn.	.....	1.95
Steelton, Minn.	.....	2.00
Toledo, Ohio	.....	2.20
Universal, Penn.	.....	1.95

*Including sacks at 10c each.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	—Plaster Board— ¼x32x 36". Wt. 1500 lb. Per M Sq. Ft.	—Plaster Board— ⅜x32x 36". Wt. 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48". Lgths. 6'-10', 1850 lb. Per M Sq. Ft.
Centerville, Iowa	3.00	3.50	15.00	8.00	9.00	9.50	9.50	.....	25.80	10.00	.....	.....	.....
Detroit, Mich.‡	.....	.....	.....	11.30	11.30	11.30	.....	8.00	.....	.....	.....	.....	.....
Delawanna, N. J. (f)....	.....	.....	.....	.....	.....	11.50||	.....	8.25s	.....	.....	14.50@15.50	15.50t	40.00
Douglas, Ariz.	.....	.....	7.00	.....	.....	15.50d	18.50	.....	30.00	15.50	.....	.....	.....
Grand Rapids, Mich.....	2.75	6.00	6.00	8.00	9.00	9.00	17.50	.....	24.55	20.00	.....	.....	.....
Gypsum, Ohio‡	3.00	4.00	6.00	8.00	9.00	9.00	18.00	7.00	27.00	18.00	.....	20.00	30.00
Hanover, Mon‡	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles, Calif.....	.....	.....	.....	10.30k	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Clinton, Ohio.....	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00	.....	20.00	30.00
Portland, Colo	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.....	.....	.....	.....	12.00	13.40r	14.40r	.....	15.40r	.....	.....	.....	.....	.....
Seattle, Wash. .....7.00@8.00	.....	.....	10.00	13.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sigurd, Utah	.....	.....	.....	.....	.....	.....	.....	.....	18.00a	.....	.....	.....	.....
Winnipeg, Man.	5.00	5.00	7.00	13.00	14.00	14.00	.....	.....	.....	.....	20.00	25.00	33.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable).
*To 3.00; †to 11.00; ‖to 12.00; ‡prices per net ton, sacks extra; (a) to 21.00; (b) net; (c) gross.
(d) hair fibre; (f) delivered; (h) delivered in 6 states; (i) delivered on job: (k) sacks 12c extra, rebated.
(m) includes paper bags; (o) includes jute sacks; (r) including sacks at 15c; (s) to 9.40; (t) to 16.50.

New Machinery and Equipment

A New Agitator and Thickener

A MACHINE which is quite new to the rock products industries is made by the Hydrotator Co., 110 East 42nd street, New York. It is said that it will find application in the washing and recovery of gypsum phosphate sands, glass sand and other fine sands, in the recovery of cement and lime plant flue dust, lime slacking and causticization and chemical processes.

The operation of the machine is illustrated in Fig. 1.

The circulation induced by the pump (3) causes the agitating arms (4) to revolve, resulting in an adjustable uniform upward current as far as the pump intake (2). Material is fed through hopper (1). Clear

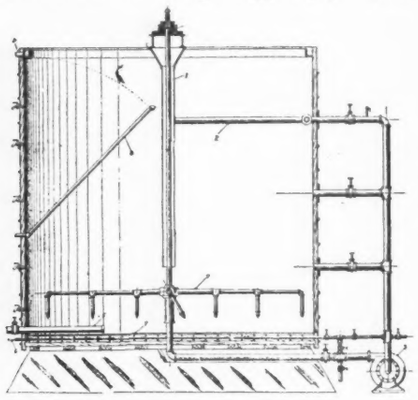


Fig. 1. This shows the operation of the machine

solution is decanted from launder (9) or decanter (8). If desired the larger and heavier particles may be discharged through pipe (5). A filter bottom (7) may be used for clarifying.

Fig. 2 shows one arrangement that is used where mixed sizes are being thickened, and also where there is a separation of the heavier constituents, as in clay washing. The waste joins the sand on the bottom and eventually is washed into the screw conveyor and discharged. Where merely a thickening action is desired the conveyor is omitted.

The makers say that:

"Sand filters must have some means of keeping the filtering surface in a comparatively constant condition, so that it may not gradually become 'blinded' by an accumulation of the thickened material. This is accomplished by the adjustment of the nozzles at the correct height above the sand surface.

"The discharge for thickened material can be located at any level between the sand bed and the intake of the pump, preferably at a point about half way between these two levels. Such modifications can be made to suit the problem under consideration.

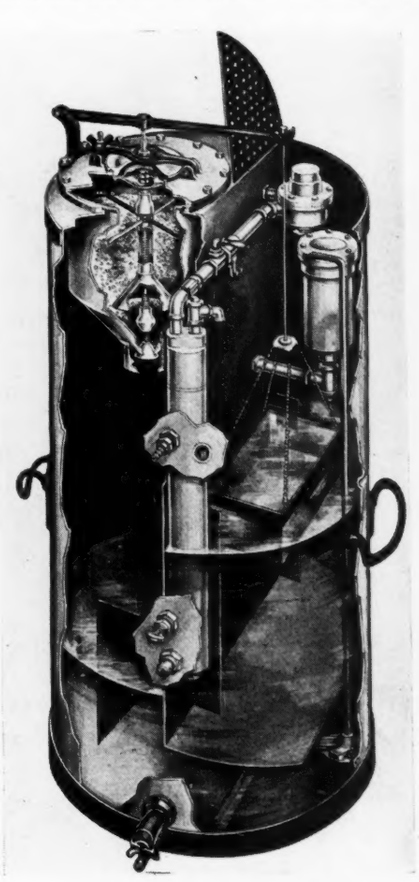
"There are some cases where it is desirable to handle smaller amounts of water with greater percentages of solids. In this case the proportions of the machine would be changed, and the tank would be of smaller diameter in proportion to its height. This design also affords greater storage capacity. There is no reason why the height of the tank could not be almost indefinitely increased for the purpose of increasing the capacity for storage."

New Portable Acetylene Generator for Welding

PRACTICALLY every rock products plant of importance employs a welding outfit, and uses it to make repairs not only in the shop but all over the operation. Hence a generator which is not only dependable but one which can be loaded on a truck and taken anywhere is of interest.

The generator empty weighs 210 lb. and fully charged it weighs 530 lb. It will hold 35 lb. of carbide, equivalent to 157½ cu. ft. of gas. The makers claims it can stand an overload of 300% if occasion demands and that it can be cleaned, recharged and purged in 15 min.

The section shows the operation. The carbide is in a cone on one side of a partition, and the feed of carbide to the water is



New portable generator

regulated by a float on the other side of the partition. The height of this float is dependent on the gas pressure. The gas which is

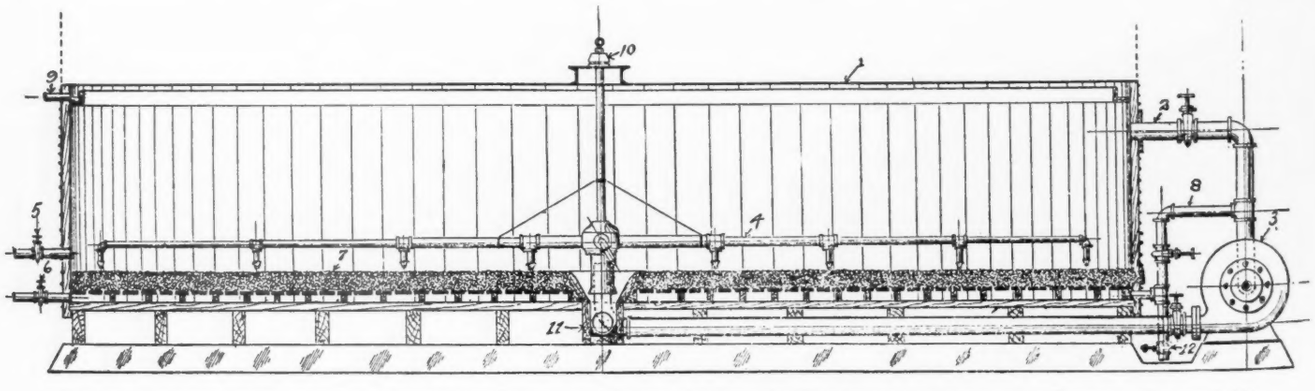


Fig. 2. An arrangement used where mixed sizes are being thickened. The heavier sizes accumulate on the sand filter and are washed to the screw conveyor and discharged

generated by the carbide falling into the water passes through a ppie with a water seal to drain off condensation and then through felt filtering disks to a pressure regulator which insures a constant pressure to the gas fed to the torch.

An automatic device stops the feed of carbide if anything goes wrong with the mechanism or if an excess of pressure is applied. Any after generation is taken care of by a relief vent which works at 26-in. water pressure. The generator does not have to be set absolutely level; the makers say it has been successfully worked with a tilt that raised one side 4¾ in. above the other. These are features that make the device safe. Handles are provided so that it may be carried anywhere by two men.

The generator is made by the Oxweld Acetylene Co. of Long Island City, N. Y.

New Wood Fibre Machine

MAKERS of gypsum products will be interested in a new machine for turning logs into wood fibre. The following description is furnished by the makers, J. B. Ersham and Sons Manufacturing Co., Enterprise, Kans.:

The machine takes a log of maximum diameter of 30 in. and a maximum length of 22 in. It is provided with a Reeves variable speed control and as the log diminishes in diameter the number of revolutions that the log makes increases, the surface speed, as well as the depth of the cut, remaining constant from the time the cut starts until the log is reduced to a diameter of about 3 in.

It is provided with an automatic trip so that when the cutting operation is completed and the log is cut down the feed stops automatically.

The clutch is then released and the arms holding the log are pulled back into starting position by hand. The core is removed and a new log inserted. The clutch is then shifted into operating position and by shifting a lever the feeding mechanism is again put in operation.

The saw mandrel runs continuously during the entire operation and need not be shut down when a new log is put in position.

The construction of the machine is very simple throughout. The bevel gears and pinions are made of steel and hardened. The spur gears are cast iron with machined teeth. The spindle holding the saws is made of special steel and the bearings for this spindle are babbitted collar oiling type. The machine can be quickly changed to making a fine fibre or a coarse fibre. The time required for reducing a log 30 in. in diameter to approximately 3 in. is from 20 to 30 min., depending on the fineness of the fibre required.

The manufacturers say that they will ship these machines to responsible concerns requiring a machine of this type on 30 days' trial.

New Batcher Bin Which Also Gives Bulk Loads

BATCHER bins are now a part of the plant equipment of many operations, especially those from which concrete aggregate is supplied to large jobs.

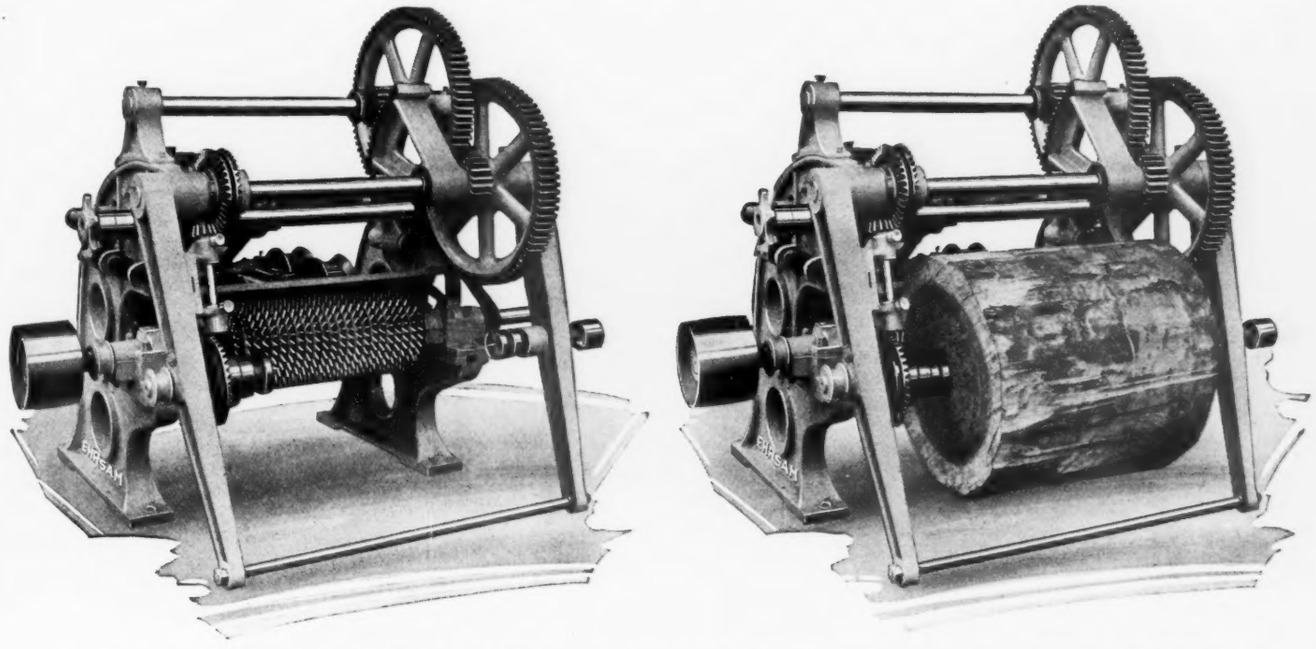
The James B. Seaverns Co. of Chicago, Ill., has recently put out batcher bins of a new type which is illustrated here. They are made of heavy structural steel and ¼-in. plate and have a heaped capacity of 100 yd. According to the makers, the batcher hoppers are adjustable from 10 to 25 cu. ft. and they may be discharged singly or in groups to suit the partitions on the batch truck so that a load may be secured without loss of time. The supply and dump gates may be controlled by an attendant at the bin.

Trucks desiring bulk loads may be loaded from a clamshell gate in the lower section

A new batcher bin

and these gates have extension rods so that the truck driver may open and close them without leaving his seat.

As the old-time methods of mixing concrete by wheelbarrow loads and guessing become obsolete, batchers will come more and more into use.



Two views of the new wood fibre machine. The saw mandrel runs continuously and need not be shut down when a new log is put in position

News of All the Industry

Incorporations

Portage Concrete Products and Gravel Co., South Bend, Ind., $30,000.

Gypsum Securities Corp., Wilmington, Del., $10,000. To deal in gypsum, etc.

R. M. Weblemoe Co., Fairbury, Neb., to engage in production of sand and gravel.

Calcine Clays, Savannah, Ga., $25,000. T. F. Walsh, Realty building. To develop quarries, etc.

American Sand and Gravel Co, Hattiesburg, Miss., $25,000. M. H. Cox, S. O. Trest and others.

Concrete Sand and Gravel Co., Inc., Baton Rouge, La., has increased its capital from $50,000 to $75,000.

Mission Staff & Stone Co., Inc., Los Angeles, Calif., $50,000. James M. McGrath, Hugo Radke and R. Telford.

Golden Dredge Crushed Rock Co., Denver, Colo., $20,000. W. Crowley, P. Huggins and H. Lamont. Office at Denver.

Superior Portland Cement Co., Inc., Seattle, Wash., $5,000,000. L. E. Tyman, A. Sherman Ellsworth and Oscar M. Winfree.

Maine Sand and Gravel Co., Portland, Maine, $150,000. G. C. Owen, H. C. Starr and M. G. Mitchell.

Greenville Gravel Co., Greenville, Ohio (Ohio corporation), has filed certificate of withdrawal from the state of Indiana.

Ford-Rogers Co., New York, N. Y., 500 shares, no par. W. Bishop, H. R. Wright. (Attorney, W. F. Bishop, 161 East 33rd street, New York.) Quarrying, etc.

Batesville Cement Co., Little Rock, Ark., $10,000. D. B. Coleman, S. M. Casey and J. Q. Wolfe To manufacture and market cement and cement products.

Crescent Silica Co. has changed its name to Buffalo Rock Silica Co. Correspondent, Miller, Gorham, Wales and Noxen, New York Life Insurance building, Chicago, Ill.

Green Owl Plaster Sheet & Building Products Co., Los Angeles, Calif., $200,000. Paul Beygrau of Berkeley; Harold L. Finlay, of Glendale; and H. D. Hitchcock of Los Angeles.

Frank Karge Cut Stone Works, Inc., Chicago, Ill., $30,000. F. R. and W. E. Karge. Correspondent, Rothfe and Connor, 11 South La Salle street, Chicago. To mine, quarry and prepare limestone and other stones and minerals.

Carbon Concrete Brick Co., Hillsville, Penn. (subsidiary of Carbon Limestone Co.), $100,000. Robert Bentley, F. O. Earnshaw, H. T. McCartney, H. W. Feather and M. S. Logan. To manufacture concrete brick from limestone screenings and cement.

Quarries

Crystal River Rock Co., Williston, Fla., will establish a crushing plant of 75 cars daily capacity on the farm of J. M. and A. J. Mixon.

Gopher Stone Co., Minneapolis, Minn., has let the contract for construction of a $20,000 stone crushing plant at 1501 Johnson street.

Ash Grove Lime Co., is reported to have leased a quarry owned by them to a group of Carthage capitalists. It is said that this group will soon begin operation of the marble deposits.

Cold Spring Granite Co., Cold Springs, Minn., is planning the rebuilding of its power house and machine shop recently destroyed by fire. The loss was estimated at $100,000 which includes machinery.

Mt. Princeton Quarry, Salida, Colo., is installing new machinery preparatory to increasing the output. The company has completed a power house and pipe line, and is now setting up motors and preparing to build a dam.

John S. Swingle, Quincy, Mass., has obtained a permit from the city authorities for such construction as may be needed to erect a crushing plant at the Badger quarry, West Quincy. Plans indicate that the proposed plant will be of fairly large capacity and modern equipment.

Bethany Crushed Stone Co., Bethany, Mo., is still operating on part time. All orders for crushed stone have been filled, according to H. J. Rand, and it is impossible to say when the plant will resume a full time schedule. Wet weather, earlier in the season forced the company to suspend operations continually.

Ripy Brothers, Lawrenceburg, Ky., has purchased the Harry Dobson quarry in Ripley County, Indiana, and are conducting the business under the name of the Ripley County Limestone Quarries Co., with mail offices at Lawrenceburg. The chief item produced is building stone, but the spalls, etc., are crushed to agricultural limestone and sold in the district.

Micolithic Co., Houston, Texas, is to erect in Culberson and Hudspeth counties, a 12-car daily capacity plant for the crushing of micaceous rock. In conjunction with the plant, there will be laid 5½ miles of track to connect it with the Southern Pacific railroad. The company will install a mica grinding mill of 200-ton capacity, aerial tramways and additional equipment for the handling of 100 tons daily of microline potash feldspar with roasting and grinding mill for the preparation of 50 tons daily of paint material. Thomas J. McCabe, Cotton Exchange building, is in charge of developments.

Sand and Gravel

Pioneer Sand and Gravel Co., Seattle, Wash., is building bunkers at 679 E. 39th street, at a cost of $1700.

Multnomah County, Ore., commissioners, recently awarded contract for 750 cu. yd. of gravel on a bid of 50 cents per cu. yd. to J. W. Schild.

Scotts Bluff County, Neb., has recently purchased and installed a gravel screening outfit for use at the pits operated by the highway department.

Rock Island Sand and Gravel Co., Rock Island, Ill., has leased the use of levee property from the city for a period of five years. Rental is to be $1200 annually.

Wisconsin Lime and Cement Co. has purchased 169 acres of gravel land at Cary, Ill. The company has had an option on the land for the past two months and carried out extensive test borings.

West Jersey Sand and Gravel Co., Philadelphia, Penn., has purchased 23 acres of land on Princeton avenue for a reported $140,000 and are to erect a screening and truck loading plant at the location. Conveying, loading, hoisting and other equipment will be installed.

Mark Levy has filed suit in the district court of Kansas for dissolution of the Turner Sand Co., Kansas City, Kas., of which he and George Holler are copartners. He alleges that Holler is about to sell the property of the two and asks the appointment of a receiver by the court.

C. H. Hansen, Rockingham, Iowa, has filed a petition in the Scott county district court for a temporary and permanent injunction restraining the Builders Sand and Gravel Co. and Herman Oelerich from violating riparian rights on property he owns along the river at Rockingham.

Ontario Supply and Transportation Co., Sarnia, Mich., has been formed by a group from Detroit. The company is said to have acquired 200 acres of gravel land in the district and to have plans under way for the erection of a modern washing and screening plant.

Independent Sand and Gravel Co., Des Moines, Iowa, was granted a temporary stay of the injunction against operating trucks over certain roads recently secured by residents of a residential district of that city. The residents contended that the trucks were ruining roads designed for the use of light vehicles only. The case will come up for final decision in the supreme court where the original injunction granted by the district court will be enforced or the permanent stay ordered.

Cement

Pittsburgh Plate Glass Co., Pittsburgh, Penn., is to erect a power plant at its cement plant at Fultonham, Ohio.

Missouri Portland Cement Co., St. Louis, Mo., has taken option on a site near Earnhart, Ark. It is expected that the company will erect a cement plant at that place within a short time.

Bessemer Limestone and Cement Co., Youngstown, Ohio, will shortly move their executive and sales office from the plant to the Stambaugh building, Youngstown.

Louisiana Portland Cement Co., New Orleans, La., is receiving bids for the piles and pile driving necessary for the erection of their proposed new office and machine buildings.

Hercules Cement Corp., Morris Kind, Philadelphia, Penn., president, has let the contract for erection of a packing house and storage building No. 2, at a cost of $150,000.

Atlas Portland Cement Co., N. Y., entertained a party of 25 engineers and contractors from Boston recently. The visitors inspected the Hudson plant and attended a luncheon tendered by the Atlas company.

Acme Cement Corp. has awarded the contract for the new construction to be made shortly at their plant to the Turner Construction Co. McClellan and Junkersfeld, New York City, have been engaged as engineers in charge of all the proposed changes.

Lehigh Portland Cement Co., Allentown, Penn., has acquired limestone properties near Hazen, vicinity of Belvidere, N. J., and is said to be planning the early installation of quarrying machinery and other equipment. The output will be used at the new mill of the company now in course of construction at Sandt's Eddy, near Martin's Creek, Penn.

International Cement Corp., New York, announces that production operation will stop in early December at two of its subsidiary companies, the Kansas Portland Cement Co. with a mill near Bonner Springs, Kan., and the Indiana Portland Cement Co. with a mill at Limedale, Ind. This is due to the October and November inclement weather for building construction, which caused an unseasonable slackening in the demand for portland cement and early filling of warehouses.

Louisville Cement Co., at Akron, N. Y., has completed a spur from the Batavia-Tonawanda branch of the N. Y. C. railroad, and excavation for storage tanks and will soon carry to completion the new cement mill. A private crushed stone road has been completed from highway to the plant and the town is macadamizing the dirt road (public) for a distance of about ¾ miles to connect with a complete system of New York state highways. This will facilitate local trucking to Buffalo, Lockport, Tonawanda, Batavia and other near points.

Gypsum

American Plaster Division of the Beaver Products Co. at Akron, N. Y., has completed its foundation for the new 125x400 ft. block plant and have started relocation of their new spur.

National Gypsum Co., near Clarence, N. Y., has completed the spur from the Batavia-Tonawanda branch of the N. Y. C. railroad to their leases and will push to completion their new plant.

National Gypsum Co., Buffalo, N. Y., is reported to have plans under way for the erection of a gypsum wall board plant in Ohio. Plant will include a crushing unit, boilers, dryers, motors, etc. J. F. Haggerty, 415 Jackson building, Buffalo, is the president.

Standard Gypsum Co., Long Beach, Calif., have issued a 16 page booklet on the uses of gypsum for agricultural purposes. The contents include description of the methods and amounts of gypsum to be applied for different crops and an analysis of their product "Bumper Crop Agricultural Gypsum." There are many interesting notes from various geological surveys and agricultural bureaus on the value of gypsum as a fertilizer.

Cement Products

Nebraska Cement and Concrete Manufacturers Association held a meeting recently at Lincoln, Neb.

Stuart Duntile and Cement Products Co., Stuart, Fla., are reported to have acquired a site for the establishment of a "Duntile" plant.

Concrete Products Corp., Astoria, Ore., has been sold to J. W. Ellis and E. W. Bellinger, and the name changed to Astoria Concrete Products Co.

Carbon Concrete Brick Co., recently formed as a subsidiary of the Carbon Limestone Co., Youngstown, Ohio, with a capital of $100,000, will soon begin work on a new plant at Hillsville, Penn., for the manufacture of concrete-limestone bricks, blocks, etc. It will cost approximately $65,000 with machinery. Robert Bentley heads the company.

Lime

George T. Russel's lime plant at Jersey City, N. J., was destroyed by a recent fire with a loss of $5000. The plant, a two-story frame building which was used for crushing oyster shells and making lime, was covered by insurance.

Superior Lime and Hydrate Co. of Pelham, Ga., has 1000 acres limestone deposit and are building two additional kilns, making preparations and laying foundations for two other kilns to increase capacity to 800 bbl. daily. Hydrating machinery, crushers, equipment to make concrete bricks, tile, etc., will be installed. H. G. Bridgewater is president of the company.

Agricultural Limestone

J. A. Nobbman has been awarded the contract by the Lincoln County Farm Bureau for the pulverizing of 500 tons of limestone for use by farmers of Lincoln county, Mo.

Sam Moore, of the Oregon State Limestone Board, recently inspected the state plant at Gold Hill, Ore. He reports that although conditions for production are good, prices of limestone to farmers will be higher because of the increased freight rates, upkeep and increase of wages due to the free labor replacing the original prison labor.

Phosphate

Columbus Fertilizer Co., Columbus, Ga., has work under way on remodeling the former mill of the Virginia-Carolina Chemical Co., recently acquired. The company has removed machinery from its former plant at Eleventh street and Tenth avenue, and will install equipment to more than triple the output of the mill. Drane Bullock is president, and L. W. Cunningham, secretary and treasurer.

Sand-Lime Brick

South Baldwin Brick Corp., Box 22, Foley, Ala., is erecting a sand-lime brick plant with a capacity of 18,000 brick per day. Construction is carried on by the company.

Crushed Slag

Clinton Iron & Steel Co., Pittsburgh, Penn., at a cost of about $100,000, will erect a slag crushing plant at its works. The Duquesne Slag Products Co. will install the plant.

Talc

American Talc Co., Inc., has leased from Dr. C. C. Trowbridge a deposit of talc at Oakfield, Wis.

Miscellaneous Rock Products

Banner Rock Products Co., Anderson, Ind., has almost completed their new factory and storage building. The company manufactures mineral wool products which are shipped to all parts of the country.

Obituary

Frank E. Spooner, retired Chicago business man and founder of the Chicago Union Lime Works, dropped dead recently on a train. Mr. Spooner, who was 81, had not been active in business since 1893.

Personals

Jack Harris, traffic manager of the Fischer Lime and Cement Co., was elected president of the Traffic Club of Memphis, Tenn., at a recent annual election.

C. F. Phillips has been appointed representative in charge of Wilkes-Barre, Penn., office of the Allis-Chalmers Manufacturing Co. Mr. Phillips, who was formerly connected with the Philadelphia office of the company, succeeds Guy V. Woody.

W. F. James has been appointed manager of the Philadelphia district of the Westinghouse Electric and Manufacturing Co., succeeding H. H. Seabrook, who has been assigned to special duties. Mr. James has been with the company since 1909. For the five years previous he had been superintendent of the Quaker City Electric Co. In 1923 he was made manager of the industrial division, which position he held until his present appointment. For many years, Mr. James has been active in the local sections of the American Institute of Electrical Engineers and the American Iron and Steel Electrical Engineers Society, serving as secretary of each organization. From 1918 to 1919, Mr. James was chairman of the Philadelphia section of the American Institute of Electrical Engineers. In 1921-22, he was president of the Engineers' Club of Philadelphia.

Trade Literature

NOTICE—Any publications mentioned under this heading will be sent free unless otherwise noted, to readers, on request to the firm issuing the publication. When writing for any of the items kindly mention ROCK PRODUCTS.

Boilers, Engines, Pumps, Etc. Bulletin illustrating and describing boilers from 12 h.p. to 150 h.p. capacity, portable boilers, center and side crank engines, dredging pumps, rotary dryers, etc. Details of construction, specifications, etc.; 46 pp. 8½x11 in. J. S. SCHOFIELDS' SONS CO., Macon, Ga.

Motor Trucks. Illustrated bulletin No. 69, featuring variety of industrial uses of motor trucks. Features heavy duty, power dumping truck for use in rock products industries. 32 pp. 8½x11 in. WHITE CO., Cleveland, Ohio.

Engines, Portable Power Houses. Bulletin "A" describes the "K" series, four cylinder, 5x6½-in. engine. Bulletin "B" covers the "T" series, four cylinder, 5½x7-in. engine. Bulletin "C" describes the "R" series engine, which is made in two models—Model "R4U" covering the four cylinder, 6x7-in. engine and Model "R6U" covering the six cylinder, 6x7-in. engine. These series of engines develop power ranging from 35 to 130 h.p.

Bulletin "D" covers the "K" and "T" series portable power houses which are designed for operating hoists, portable saw mills, mine ventilators, power pumps, generator power, etc., and anywhere industrial gasoline engines of 44 to 75 h.p. may be used. Data on equipment, specifications and coded prices, etc.; 8½x11 in. CLIMAX ENGINEERING CO., Clinton, Iowa.

Oil Burner Testing. Bulletin on methods and procedure of testing oil burners. Contains all complete data, tables and formulae necessary as well as theoretical considerations for practical application of methods. 28 pp., 75 cents. AMERICAN OIL BURNER ASSOCIATION, New York, N. Y.

Air Washers. Bulletin No. **1923** describing and illustrating **Sirrocco** air washers for use in industrial plants. Features special flushing nozzles and rugged construction of washers. Diagrams, specifications and capacity of different types. Includes psychrometric and comfort charts for determining correct degrees of ventilation and humidity needed. Design of model automatic humidity controlling system. AMERICAN BLOWER CO., Detroit, Mich.

Blasting Accessories. A comprehensive illustrated booklet which gives complete and detailed data on various accessories needed for firing charges of explosives, together with explanations of the best methods of using these accessories. 80 pp. E. I. DU PONT DE NEMOURS CO., Wilmington, Del.

Vibrating Screens. Bulletin No. **12-A**, illustrating and describing standard surface belt drive Leahy screen for material from 1½ in. to 50-mesh. Features use of double deck type for sand and gravel operations and dust proof type for lime, cement, etc. Details of construction, operation, equipment, specifications, etc. 8 pp. 8½x11 in. DEISTER CONCENTRATOR CO., Fort Wayne, Ind.

Mechanical Drive Turbine. Bulletin **GEA-197** describing type D-54 mechanical drive turbine for driving centrifugal pumps, blowers and other classes of mechanical drive. The turbine is described and a sectional view shown. GENERAL ELECTRIC CO., Schenectady, N. Y.

Manufacturers

Hardinge Co., York, Penn., have recently installed a No. A8 Ruggles-Coles dryer at the Spocari, Ala., plant of the Warrior Cement Corp.

F. L. Smidth & Co., N. Y., are making a $100,000 addition to their Elizabeth, N. J., factory in order to take care of increased business. The company maintains a machine shop foundry and technical laboratory at the factory.

The Osgood Co., Marion, Ohio, has appointed T. L. Pitts, former sales representative for the company at Charlotte, S. C., division sales manager in charge of the South Atlantic seaboard territory. M. D. Moody of Jacksonville, Fla., and I. W. Phillips of Tampa, Fla., have been appointed as sales representatives for their respective territories.

Foote Bros. Gear and Machine Co., Chicago, Ill., were among the exhibitors at the recent New York Power Show. Besides their standard spur and worm gear reducers, this company exhibited their new vertical worm gear reducer—vertical spur gear reducer and right angle drive spur gear reducer, and a combination unit consisting of a spur and worm gear speed reducer connected together by flexible couplings and driven by a one-quarter h.p. motor.

When Our Gasoline Gives Out?

THE use of producer gas for motor vehicles is becoming more and more popular, and technical opinion is so much in favor of it that the time is not far distant when its use will be universal.

The combustion of producer gas is slow and smooth, which gives advantages over the explosive combustion characteristics of the derivatives of earth oil. Again, the inlets, cylinders, and pistons of a producer gas driven engine are clean, whereas in the case of fuel oil condensation takes place in the engine's interior and approaches. Sudden acceleration tears off this film causing saturation of the mixture and its attendant troubles. Lubricating oil becomes diluted—"knocking" takes place, owing possibly to the constituents of oil fuel having different physical and chemical qualities and ignition temperature—not infrequently hundreds of degrees apart.

For small producer gas plants, retort-made charcoal of hard wood, gives excellent results, due to the purity of the gas, the absence of tar and clinker, and it is the most economical.

For a given horse-power the ratio of charcoal used as against coke or anthracite would be about as 2 is to 3.

British manufacturers are deservedly ahead of all others in the manufacture of producer gas plants, and there are plants now on the market designed for light vans and tractors, including the Ford tonners, and the Fordson tractor, besides the heavier vehicles.—*British Commercial News.*

World's Tallest Concrete Building

THE International Cement Corporation has published a bulletin describing the use of International cement in the new Palacio Salvo, Montevideo, Uruguay. The new structure is said to be the world's tallest concrete building. The bulletin also contains the brief history of the Virginia Portland Cement Corp., which is now ready to begin the operation of its new plant at Norfolk, Va.